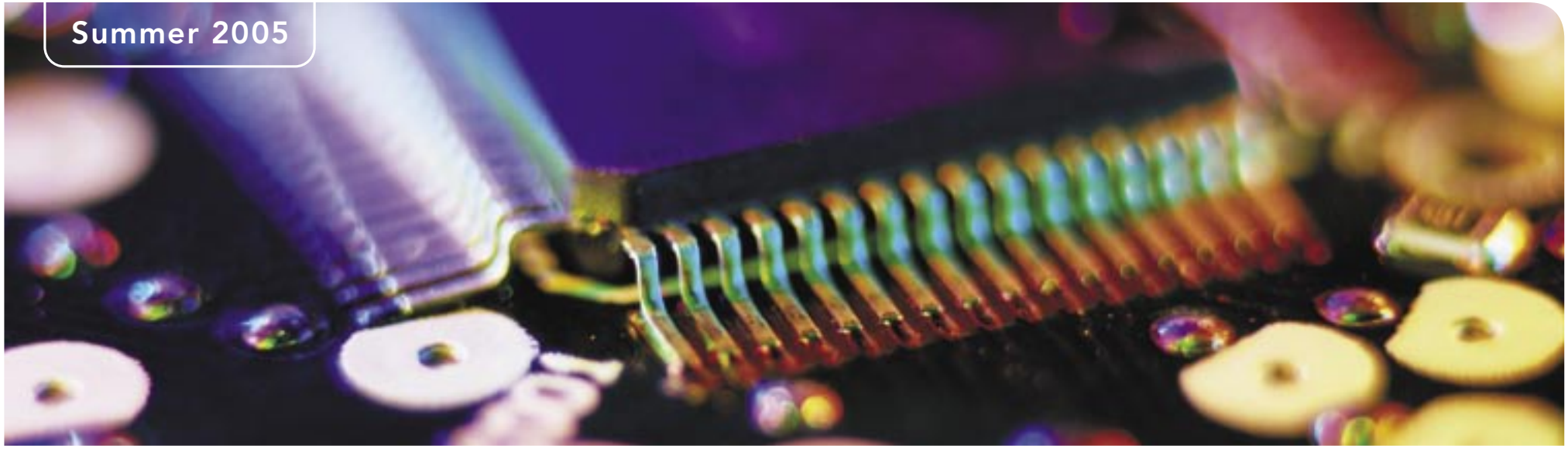
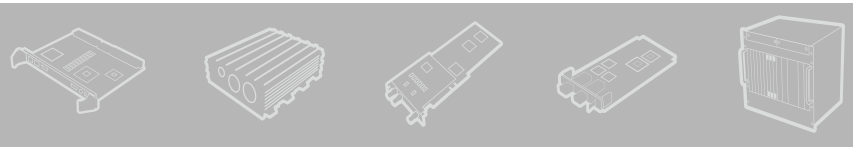
Summer 2005





Product Selection Guide

SBS knows.

SBS Technologies®

CONTENTS

SYSTEMS & ENCLOSURES 2
"Rugged COTS Systems" 3
Advanced Vehicle Computers 4
Rugged Chassis 5
"The Rugged RIU-1000" 6
Starter Cages 7
Standard Cages 7

SINGLE BOARD COMPUTERS 8
"SBS Ruggedization Levels" 9
CompactPCI Intel 10
CompactPCI PowerPC 11
VMEbus Intel 12
VMEbus PowerPC 12
PrPMC PowerPC 13
Processor AdvancedMC 13
Industrial PC 13

FPGA COMPUTING 14
"Real Time Video Compression on a PMC" 15
TS-Series FPGA Processors 16
I/O Modules 16
Development Kits & Software 17

I/O & COMMUNICATIONS 18
"AdvancedMC™" 19
InfiniBand Data Communications Switches 20
InfiniBand Host Channel Adapters 20
"VITA 41. Forward Looking" 21
Fibre Channel Host Bus Adapters 22
Gigabit Ethernet Switches 23
Gigabit Ethernet Interfaces 24
Fast Ethernet 25
WAN Sync Serial Interface Modules 26
WAN DS3/E3 Interface Modules 26
"Comprehensive WAN Product Line" 27
WAN T1/E1/J1 Interface Modules 28
WAN HSSI Interface Modules 29
WAN OC-3 & OC-12 Interface Modules 29
"MIL-STD-1553 Reliable. Irreplaceable" 30
MIL-STD-1553 31
Serial I/O 33
ARINC 429 34
Telemetry Systems 35
Data Bus Analysis Software 36
Graphics & Video 37
Audio 37
iSCSI 38
SCSI 38
Analog I/O 39
Digital I/O 39
DSP-Based I/O 40
Other I/O 41
"Plug PC into a VME Chassis" 42
Bus Adapters 43
IEEE 1394 Host Bus Adapters 44
dataBLIZZARD 44
HIPPI 44
PCI Express to PCI-X Expansion 46
PCI Expansion 46
Carrier Cards 47
IndustryPack Carrier Cards 48
IndustryPack Modules & Transition Modules 49

Product Index 52

THE SBS ADVANTAGE

SBS Technologies® delivers a rich mix of standard and custom embedded computing solutions backed by our engineered technology and dedicated OEM support. SBS customers benefit from our ability to leverage our technology experience across a variety of markets. Recognizing the diverse application requirements in each market, SBS offers a comprehensive product portfolio that spans the embedded computing spectrum to include commercial and rugged single board computers, multi-purpose input/output (I/O) modules, enclosures, enabling software, and fully integrated systems. Designed for scalability, modularity and seamless integration, SBS' innovative and respected OEM products have been integrated into a variety of demanding applications and programs.

SBS' commitment to its OEM customers extends beyond providing quality and reliable product solutions. We consider our customers to be part of the SBS team. Our customers' challenges are our challenges. SBS customers can leverage advanced technology and experience to overcome time-to-market pressures, optimize limited resources, reduce development risk and satisfy price/performance challenges to gain an edge over the competition. SBS is focused on supporting its customers' full range of evolving needs from concept phase to final acceptance tests and beyond with design flexibility, prototyping services, system integration and product lifecycle management.

Recognizing the technological and economic challenges facing our customers in today's competitive marketplace, SBS delivers much more than reliable, high-performance products to our customers. SBS offers added value in the form of extensive software support and highly committed customer service to get our customers to market first with cost-effective solutions.

WHAT'S NEW?

SBS is delivering outstanding I/O and processor **AdvancedMC**™ modules that increase the power and flexibility of the latest communication and high speed data transport systems.

22. Telum FC2312-FF - This 2 Gb/s Fibre Channel HBA provides connectivity to a 4x PCI Express baseboard. It has dual fiber interfaces, provides full hot swap support, and has auto-negotiation of link speed.

22. Telum FC2312-CC - The FC2312-CC offers the same features as the FC2312-FF with dual copper interfaces.

24. Telum GE-QT - This 4-port Gigabit Ethernet NIC uses a 4x PCI Express bus. The Ethernet controller supports TCP CRC and segmentation offloading. The network interface complies with IEEE 802.3 and supports 10, 100 and 1000BaseT modes over CAT-5 cable.

37. Telum 2001-VGA - A high-quality, high-performance graphics adapter that supports a variety of SVGA/CRT monitors in a single display configuration and features Silicon Motion's Lynx3DM8+ accelerator.

13. Telum ASLP10 - A single width, full height processor board with a 2 GHz integrated low power Intel® Pentium® M processor and dual Gigabit Ethernet channels and 2GB of 400 MHz DDR2 SDRAM with ECC.

28. Telum 624/628-TEJ - With 4 or 8 full duplex ports on one card, the 624/628 offers full line rates across 4 or 8 T1/1/J1 connections, plus IPMI system management, I-TDM support, on-board CSU/DSU and Standard Carrier Grade Linux compatible drivers.

29. Telum 1001-03 - A 4-port OC-3 ATM module that maintains full line rates of 155 Mbps which aggregates to 622 Mbps, and supports up to 16,000 VCCs allowing a large number of connections to take place.

29. Telum 1001-O12 - This full duplex OC-12 ATM module offers 622 Mbps full line rate and supports up to 16,000 VCCs, with a 4x PCI Express interface, IPMI, optional APS and Carrier Grade Linux support.

46. PCIE-AMC-7S - This AMC expansion chassis system connects multiple AdvancedMCs to a standard PCI Express-based computer. It consists of an 8x PCI Express card, a 7-slot AdvancedMC chassis and cabling to connect the host card and controller.

OTHER NEW PRODUCTS FROM SBS:

38. PMC-USCSI320 - This PMC with ULTRA320 SCSI Controller is backwards compatible with Fast SCSI, ULTRA SCSI, ULTRA2 SCSI, and ULTRA160 SCSI and offers up to 320 MB/s throughput.

24. VD-FOE - This Port Failover Software for Gigabit Ethernet NICs includes a VxWorks operating system driver and is SBS Ready DriverTM compatible.

26. WANic 1001-DEM DS3/E3 - WANic 1001-DEM is a high performance, DS3/E3 ATM monitoring adapter for Wide Area Networks (WAN). This adapter can monitor a full duplex DS3/E3 ATM network.

26. WANic 521/522-DS - A multiport sync serial PCI adapter supporting a wide range of interfaces, including V.35/X.21/EIA530, T1/E1, HSSI, DS3/E3. The low-cost, high-performance, low latency design supports up to 4 physical ports.

23. CP3-GESW12M3 - This 3U CPCI 10-Port Layer-2 & Layer-3 managed Gigabit Ethernet switch features 10-port Gigabit Ethernet line speed switching, complete Layer-2 & Layer-3 routing management through serial RS-232 interface or in-band Ethernet (CLI, Telnet, HTTP, SNMP), plus extensive built-in testing (BIT). Conduction and rugged, air cooled versions available.

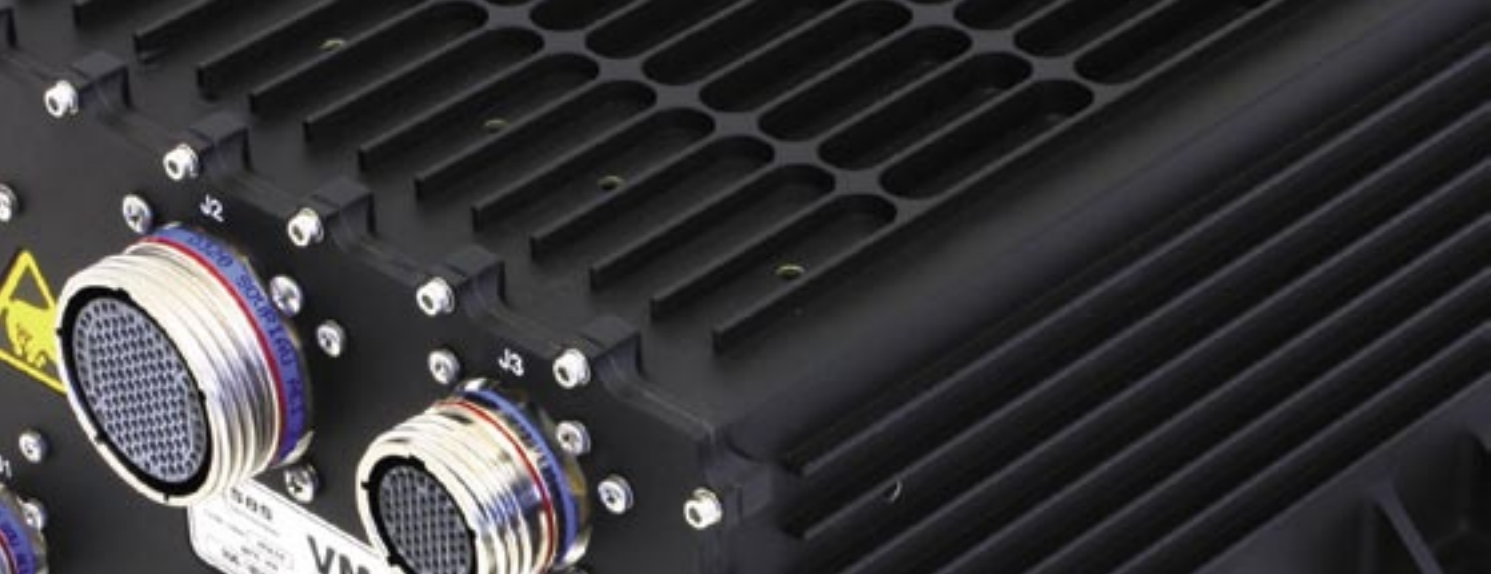
41. PIO-PMC1 - A 3U cPCI conduction cooled programmable I/O module with 8 ports of 1394B, a maximum data rate of 100 Mbit/s, PCI bus master capability for DMA transfers, four user-defined general purpose I/O, and two ports of USB 2.0.

44. 1394B-3CPCI-CC - A 3U cPCI conduction cooled board with 8 ports of 1394B, PCI bus master capability for DMA transfers, 4 user defined General Purpose I/O and 2 ports of USB 2.0 serial data communications.

33. PMC-HSSERIAL2 - A quad channel high-speed serial PMC with a maximum data rate of 10 Mb/s (synchronous) and 2 Mb/s (asynchronous) and front- and rear-panel I/O.

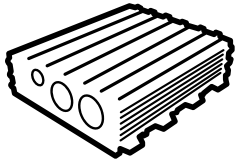
12. V2S - A 6U VMEbus single board computer with a MCP7447A G4 PowerPC® processor, up to 1 GB of DDR SDRAM, 2 Gigabit Ethernet ports and a 2eSST-compatible VMEbus bridge to the backplane.

20. IB4x-CPCI-2A - Dual 10 Gb/s InfiniBand 4x optical enabled PMC HCA, supports IB4X-OMC media converter with copper or fiber selectable on a port by port basis ports, drivers for Linux included, driver for VxWorks available.



SBS fully integrated SYSTEMS & ENCLOSURES satisfy demanding application requirements ranging from extended temperature ranges and varying levels of ruggedness to high availability functionality. Leveraging our extensive product portfolio, the SBS engineering design team is well equipped to create custom solutions offering skilled development as well as advanced prototyping services.

Systems & Enclosures



WITH THE COMPONENTS WE OFFER, it's possible to build almost any system you need. Start with a blank sheet of paper or customize one of our standard systems with exactly the boards and interfaces you require. Our selection of chassis, single board computers, I/O modules and drivers is constantly expanding, so please contact your SBS sales representative to discuss your specific system requirements.

Rugged COTS Systems
Engineered to withstand harsh environments.

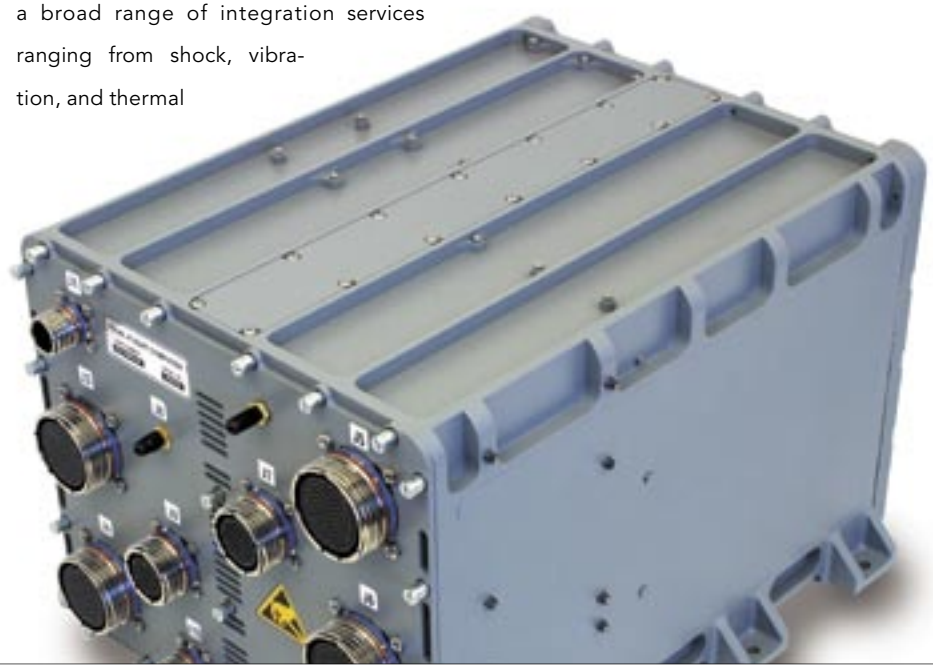
Using COTS components, SBS Technologies® builds rugged VME and CompactPCI® computing systems that allow for a high level of customization based on our selection of in-house single board computers, carrier cards, PMCs and chassis. With our experience, knowledge, design practices and software modeling tools, these fully integrated systems function reliably in the extreme conditions of heat and cold, vibration, shock, G-force and high availability that are so common in the space, avionics, military and commercial industries.

Whether you prefer the Intel® or PowerPC® processor families, we can accommodate you in a variety of processor speeds and power levels. The single board computers in our systems are conduction cooled and have passed rigid certification standards. We regularly introduce new processor boards with upgraded chips, memory modules and other ICs to improve system performance and allow for system expansion and technology insertion.

The control of EMI has been carefully considered in our chassis design. EMI filters are provided for power inputs to reduce bus conducted emissions and susceptibility. At the unit level the closure surfaces are designed to reduce line-of-sight apertures to near zero and are very effective in eliminating electronic field emissions from the system. The chassis has been tested to MIL-STD-461E.

SBS systems are compatible with proven operating systems, and SBS also provides a broad range of integration services ranging from shock, vibration, and thermal modeling to board level integration, software development, qualification, and acceptance.

Systems consist of two compartments, one containing the card slots, the other containing the power supply, transition module, and external I/O. To eliminate the possibility of backplane connector pin damage, all slots are keyed to facilitate correct insertion of cards. For increased resistance to the demands of a rugged environment, SBS eliminated the use of a backplane wiring harness and instead uses a PC board to route the I/O signals through the backplane "bulkhead" to the transition module.



Advanced Vehicle Computers | Our flexible and rugged computing platforms can be readily configured to meet the general purpose processing, I/O, video, and graphics processing needs for a variety of mission critical applications. Using open systems architecture to allow for technology insertion, SBS leverages its breadth of COTS products to conform to open standards.

Advanced Vehicle Computers

	Form Factor	Dimensions (mm) (H x W x D)	Slots	Application	CPU	Power Supply	Power Dissipation	Compatible I/0
AVC-cPCI 3000	3U CPCI	88 x 248 x 304	3	Flight Control Computer	(1) RL4	16-40 VDC, 65W	36W	HSS-PMC-CC, DIO1-cPCI3U-CC, PMC2CC-D
AVC-cPCI 3001	3U CPCI	220 x 286 x345	14	Flight Control and Mission Computer	(3) CM4	16-40 VDC, 300W	148W	(2) HSS-CPCI-CC, (2) DIO2-cPCI3U-CC, (2) DIO3-cPCI3U-CC, 1394-cPCI3U-CC, Fibre Channel, ABI-PMC2, (2) 8-port Ethernet hubs, GPS, Dual power supply
AVC-cPCI 3002	3U CPCI	220 x 286 x 345	14	Mission Computer	(2) CM4	16-40 VDC, 300W	118W	(2) HSS-cPCI3U-CC, (2) DIO2-cPCI3U-CC, (2) DIO3-cPCI3U-CC, (2) 3101-BP-CC-XT, ABI-PMC2-1, (2) 8-port Ethernet hubs, GPS, Dual power supply
AVC-cPCI 3003	3U CPCI	127 x 222 x 222	6	Vehicle Management Computer	(1) CM4	16-40 VDC, 100W	42W	CM4, DIO4-cPCI3U-CC, ABI-PMC2-2, A429-PMC2CC-8R8T, (2) HSS-cPCI3U-CC. Designed to support 1394 Firewire, additional CM4, and ABI-PMC2-2.
AVC-cPCI 3004	3U CPCI	220 x 286 x 345	7	Flight Computer	(1) CM4	16-40 VDC, 150W	59W	CM4, HSS-cPCI3U-CC, DIO2-cPCI3U-CC, DIO3-cPCI3U-CC, ABI-PMC2-1
AVC-cPCI 3005	3U CPCI	127 x 222 x 222	6	Mission Computer	(1) CM4	16-40 VDC, 100W	25W	Fibre Channel, DIO4-cPCI3U-CC, HSS-cPCI3U-CC; Designed to support 1394 Firewire, A429-PMC2CC-8T8R, ABI-PMC2-2, additional CM4 and HSS-cPCI3U-CC
AVC-cPCI 3006	3U CPCI	220 x 286 x 345	14	Mission and Flight Computer	(2) CM4	16-40 VDC, 300W	36W	DIO1-cPCI3U-CC, (2) PMCCC-4T P, 8-Port Ethernet hub, Dual power supply; Designed to support 4 additional CM4, 3 additional DIO1, 4 additional PMCCC-4T
AVC-cPCI 3007	3U CPCI	127 x 222 x 222	6	Mission Computer	(3) CM4	16-40 VDC, 100W	35W	HSS-cPCI3U-CC, ESW-cPCI 8-Port Ethernet hub
AVC-cPCI 3008	3U CPCI	127 x 222 x 222	6	Mission Computer	(2) CR3	16-40 VDC, 100W	65W	1553-CPC3-2F, and 1553-CPC3-2S with third party HSS PMC, (2) SBS cPCI carriers, (2) Sentiris PMC Video Processors
AVC-cPCI 3009	3U CPCI	127 x 222 x 222	6	Situational Awareness	CR3	16-40 VDC, 100W	59W	(2) 1553-CPC3-1S, (2) SBS cPCI carriers, (2) TS-PMC A40 Video Processors
AVC-VME 6000	6U VME	199 x 124 x 320	5	Data Link Communications	VR7	16-40 VDC, 300W	71W	ABI-V6CC-2, HSS-PMC-4, VME Flash SCSI Card, VME Plug-in power supply
AVC-VME 6001	6U VME	199 x 124 x 320	5	Data Management Control Unit	VG4	16-40 VDC, 150W	45W	VG4, Sentiris Graphics PMC. Designed to support additional A429-PMC2CC-8R8T, ASF-V6CC-2, and VME Flash Memory Module.
AVC-VME 6002	6U VME	199 x 124 x 320	5	Mission Computer	VG4, VR7	16-40 VDC, 150W	45W	HSS-PMC-CC, and Integrated conduction cooled power supply; Designed to support additional A429-PMC2CC-8R8T, ASF-V6CC-2, and VME Flash Memory module
AVC-VME 6003	6U VME	199 x 124 x 320	5	Flight Data Recorder	VR7	16-40 VDC, 150W	45W	VR7, (2) ASF-V6CC-2, and Integrated Conduction Cooled Power Supply. Designed to support additional A429-PMC2CC-8R8T, ASF-V6CC-2, and VME Flash Memory Module.
AVC-VME 6004	6U VME	199 x 124 x 320	5	Flight Data Recorde	VR7	16-40 VDC, 150W	36W	VR7 and custom-designed I/O, Integrated Conduction Cooled Power Supply
AVC-VME 6005	6U VME	199 x 124 x 320	5	Mission Computer	VG5	16-40 VDC, 300W	300W	Custom designed I/O - Consult us; VME Plug-in conduction cooled power supply
AVC-VME 6009	6U VME	216 x 268 x 450	5	Electronic Warfare Controller	VG5	16-40 VDC, 300W	160W	Custom designed I/O - Consult us; VME Plug-in conduction cooled power supply

Rugged Chassis | Rugged chassis are designed for severe environmental conditions and often developed based on customer requirements. The following reflects a partial listing of our rugged chassis capabilities. Please contact SBS with specific requirements.

Rugged Chassis

	Form Factor	Slots	Dimensions (mm) (H x W x D)	Backplane	Cooling	Power Supply
RCOM05	6U CPCI, 6U VME	5	295 x 160 x 248	CPCI, VME	Conduction Cooled	Dual in; 16-40V DC 65W
RCOM05-ATR-6V	Other	5	194 x 124 x 320	CPCI, VME	Conduction Cooled	16-40V DC 300W
RCOM06	3U CPCI	6	88 x 248 x 304	CPCI, VME	Conduction Cooled	16-40V DC 65W
RCOM10	6U CPCI, 6U VME	10	298 x 212 x 340	CPCI, VME	Conduction Cooled	Dual in; 28V DC

Remote Interface Units | Remote Interface Units offer a cost-effective, lightweight, low power, highly flexible interface for Vehicle Management Systems applications.

Remote Interface Units

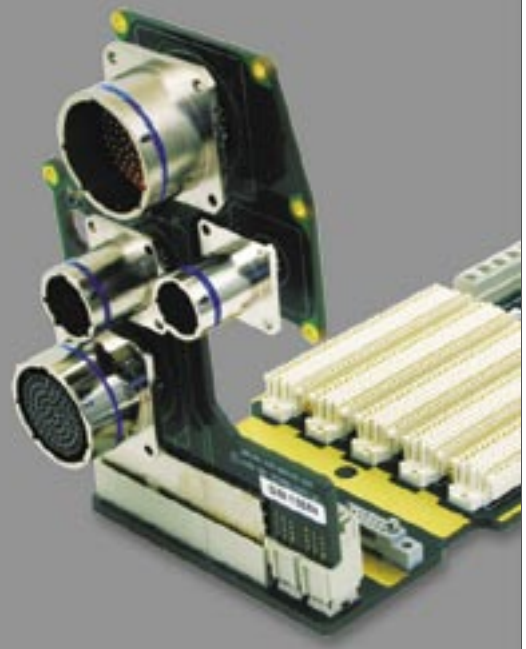
	Form Factor	Dimensions (mm) (H x W x D)	Weight in Pounds (kg)	Inputs	Outputs	Interface	Cooling	Power Supply	Power Dissipation
RIU-1000	Other	26.2 x 161 x 218	1.18	4 ±10 V Analog 4 Differential Analog 4 Frequency 32 Open/Gnd Discrete	12 ±10 V Reference 4 5 mA Current Sources 16 Differential Analog 16 Open/+28 V Outputs 24 Open/Gnd Discrete 8 TTL I/O	MIL-STD 1553	Conduction Cooled	30W, 14 to 40 V, 28 V nominal	7W

The Rugged RIU-1000
Compact Remote Interface Unit

The rugged RIU-1000's compact system measures less than 50 cubic inches, weighs 2.6 lbs and is designed for -40 C to +85 C operation in harsh vibration, shock, and EMI environments. It has an adaptable modular architecture with a predefined set of generic interfaces selected to suit a wide range of common I/O requirements. The RIU-1000's standard configuration consists of a motherboard and two daughterboards, making the system easily adaptable to changing customer requirements. One daughterboard provides a MIL-STD 1553 control interface. The other daughterboard contains a variety of discrete and analog I/O with more than 100 interface channels, and its highly flexible software interface architecture provides flexible user control and in-circuit programmability. Other control interfaces and I/O options are available upon request.

PRINTED WIRING BOARD

By eliminating the wiring harness, SBS has removed one of the most common failure points of most rugged systems. The unique feature is available in VME and CPCI configurations. The entire assembly is contained within a shielded compartment and is highly customizable. For instance, the snap-in I/O module can be customized for numerous different types of signals and connectors in addition to the D38999 series. Special provisions can also be made for RF cables with semi-rigid or other signals requiring "special handling."



AddvancedMC™ Chassis | SBS offers a chassis to carry up to 8 AdvancedMC cards. A processor AdvancedMC controls a PCI Express backplane and allows up to 7 additional AdvancedMC modules to add communications and I/O options. This is all packaged in a 2U, 19-inch chassis with a 280-watt power supply.

AdvancedMC™ Chassis

	Backplane	8x Single-Wide, Full-Height Processor AdvancedMC™	4x, Single-Wide,Full-Height AdvancedMC™	4x Single-Wide AdvancedMC™	2x, Single-Wide AdvancedMC™	Enclosure
AMC-7S-CHASSIS	PCI Express	1	1	2 Full-Height or 4 Half-Height	1 Full-Height or 2 Half-Height	2U, 19-inch Rackmount

Starter Cages | Starter cages or starter kits are pre-configured enclosures designed for development purposes. Based on the required system controller architecture (x86/PowerPC) and bus system (CPCI or VMEbus), SBS can provide the appropriate development system to satisfy your specific needs. Please note that these starter cages are only sold in conjunction with SBS single board computers. Contact the SBS sales team for details.

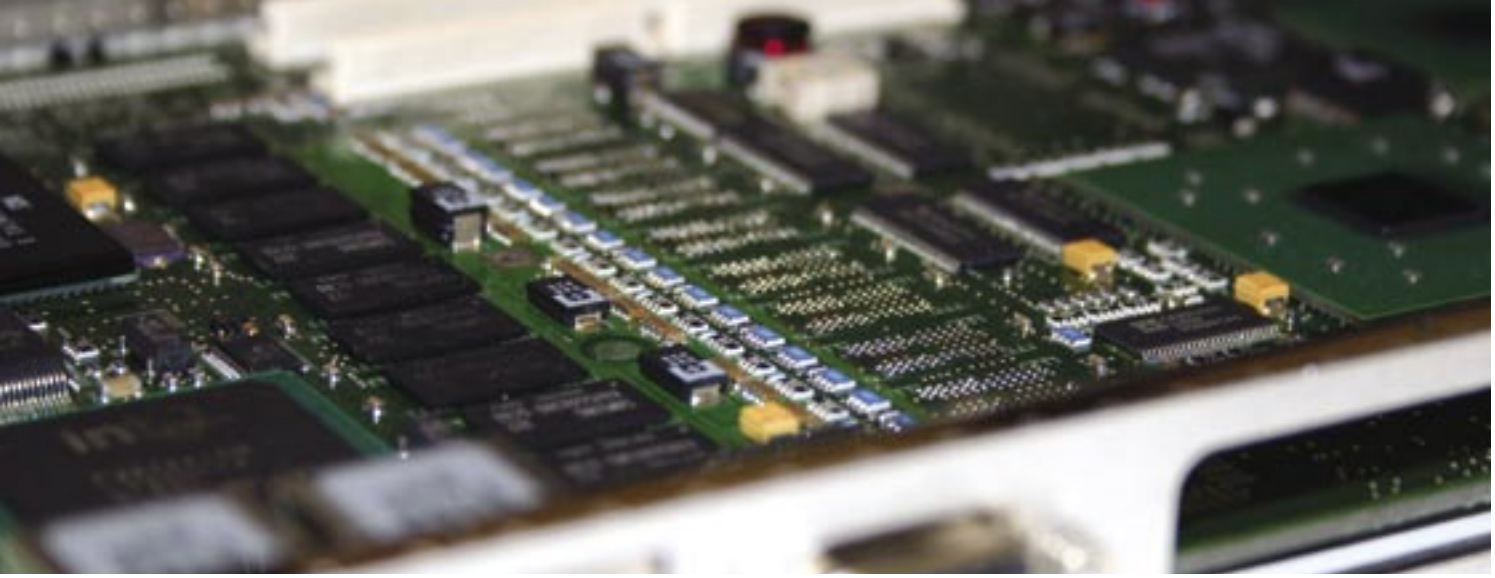
Starter Cages

	Form Factor	Height	Slots	Backplane	Fans	Power Supply	CD-ROM	Hard Disk	Floppy	I/O Transition Module	Controller
SCC484Txxx	3U CPCI	4U	4	Standard CPCI	3	250 Watts				1	RL4, LM4
SCC484Txxx	3U CPCI	4U	8	Standard CPCI	3	250 Watts	1	1	1	1	CL7, CC7
SCC784Txxx	6U CPCI	7U	8	Standard CPCI	3	250 Watts	1	1	1	1	CT8, CT7, CP7, CR6, CR7
SCC484Txxx	3U VME	4U	9	VME	3	250 Watts	1	1	1	1	VC7
SCC784Txxx	6U VME	7U	13	VME	3	250 Watts	1	1	1	1	VP7
SCC784Txxx	6U VME	7U	5	VME64	3	250 Watts	1	1	1	1	VR7, VG4

Standard Cages | Standard card cages are available in several dimensions and slot counts within the 19-inch enclosure technology. SBS builds standard and customized versions to meet specific application requirements. Contact the SBS sales team for more details. Please note that these standard cages are only available for distribution in Europe.

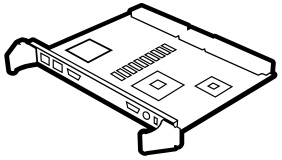
Standard Cages

	Form Factor	Height	Slots	Backplane	Fans	Power Supply	CD-ROM
SCxxx	3U CPCI	3U, 4U	6, 8	Standard CPCI	1, 3	80, 250 Watts	Optional
SCxxx	3U CPCI	7U	8	Standard CPCI	3	250 Watts	Optional
SCxxx	6U CPCI	3U	5	Standard CPCI	2	250 Watts	N/A
SCxxx	6U CPCI	7U	8	Standard CPCI	3	250 Watts	Optional
SCxxx	3U VME	4U	7, 9	VME	1, 3	80, 250 Watts	Optional
SCxxx	6U VME	3U	5	VME	2	80 Watts	N/A
SCxxx	6U VME	7U	13	VME	3	250 Watts	Optional
SCxxx	6U VME	3U	5	VME64	2	80 Watts	N/A
SCxxx	6U VME	7U	5	VME64	3	250 Watts	Optional
SCxxx	Custom Configuration						



SBS offers a comprehensive portfolio of SINGLE BOARD COMPUTERS and CPUs designed to satisfy your specific application by addressing a variety of form factors, processor speeds, memory configurations, I/O expandability, and demanding environmental requirements.

Single Board Computers



SBS IS COMMITTED TO REMAINING ON THE FOREFRONT OF TECHNOLOGY, and continues to deliver product innovations such as the VXS1, the most recent addition to our line of VMEbus single board computers. The VXS1 represents one of the first-ever implementations of VITA 41 technology, which introduces switched fabrics to the VME backplane. It offers revolutionary advances in speed and bandwidth for demanding defense, commercial and rugged applications.

SBS
Ruggedization Levels.

Like most embedded suppliers, SBS has offered a variety of environmental levels, which specify temperature, shock, vibration, etc. Each vendor in the embedded space provides its own environmental specifications, but there is no consistency between these levels. Recently, the VITA Standards Organization published the VITA 47 standard, which sets forth a very clear, precise and comprehensive set of guidelines to which every manufacturer in the industry can adhere. Perhaps more importantly, they allow customers to compare products from various manufacturers by applying the same set of benchmarks to everyone.

Now that a uniform standard has been developed by the open standards body, SBS is committed to supporting VITA 47 to the fullest extent possible. Since this new specification is primarily focused on defense and aerospace markets, SBS will continue to specify our products using our historical classifications as well as the new VITA 47 levels. Although there are differences between VITA 47 and the historical specification used by SBS, as we introduce new products we will specify them in our commercial and industrial grades as well as the new VITA 47 classes. Additionally, over the next year we will be qualifying many of our key products for appropriate classes within VITA 47. These two classes, air and conduction cooled, are further defined by VITA 47 in terms of their resistance to shock, vibration, humidity, operating temperatures, storage temperatures, temperature cycling, conformal coating, flammability, altitude, fungus resistance, rapid decompression and numerous other factors.

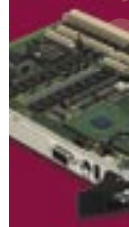
VITA 47

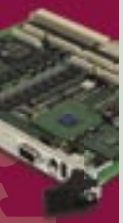
NOTE: SBS shows only some of the key factors relevant to most embedded systems: operating temperature, storage temperature, vibration (random) and shock (half sine peak) and asks that customers needing further information contact the company for a complete description of VITA 47 compliance characteristics.

COOLING METHOD	ENVIRONMENTAL CLASS	OPERATING TEMPERATURE	NON-OPERATING TEMPERATURE	VIBRATION (1 hour per axis)	OPERATING SHOCK
Air Cooled	EAC1	0 to 55°C	-40 to 85°C	Level V1: 5 Hz to 100 Hz PSD=0.04 g2/Hz	20g 11 millisecond half-sine
	EAC2	-40 to 55°C	-40 to 85°C		
	EAC3	-40 to 70°C	-50 to 100°C		
	EAC4	0 to 55°C	-40 to 85°C	Level V2: 5 Hz to 100 Hz PSD increasing at 3 dB/octave, 100 Hz to 1000 Hz PSD=0.04 g2/Hz, 1000 Hz to 2000 Hz PSD decreasing at 6 dB/octave	
	EAC5	-40 to 55°C	-40 to 85°C		
	EAC6	-40 to 70°C	-50 to 100°C		
Conduction Cooled	ECC1	0 to 55°C	-40 to 85°C	Level V3: 5 Hz to 100 Hz PSD increasing at 3 dB/octave, 100 Hz to 1000 Hz PSD=0.1 g2/Hz, 1000 Hz to 2000 Hz PSD decreasing at 6 dB/octave	40g 11 millisecond half-sine
	ECC2	-40 to 55°C	-40 to 85°C		
	ECC3	-40 to 70°C	-50 to 100°C		
	ECC4	-40 to 85°C	-55 to 105°C		

Historical SBS Build Grades

RUGGEDIZATION LEVEL	OPERATING TEMP (°C)	STORAGE TEMP (°C)	VIBRATION (RANDOM)	SHOCK (HALF SPINE)	HUMIDITY (NON-CONDENSING)
C = Commercial Temp	0° to 70° with air flow	-40° to +85°	5-100 Hz, 2g	12g peak/6ms	5-95% @ 40°C
I = Extended Temp	-40° to +85° with air flow	-40° to +85°	5-100 Hz, 2g	12g peak/6ms	5-95% @ 40°C
R = Extended Temp, Rugged, Air Cooled	-40° to +85° with air flow	-55° to +105°	5-2000 Hz, 2g	20g peak/6ms	5-95% @ 40°C
N = Rugged, Conduction Cooled	-40° to +85° at card edge	-55° to +105°	5-2000 Hz, 14g	100g peak/6ms 40g peak/11ms	5-95% @ 40°C





CompactPCI Intel® | SBS provides a comprehensive line of Intel-based CPCI single board computers to the embedded board market. These boards range from those addressing the unique needs of specific applications within the telecommunications and military markets to more general purpose products that can be applied to a wide variety of customer applications.

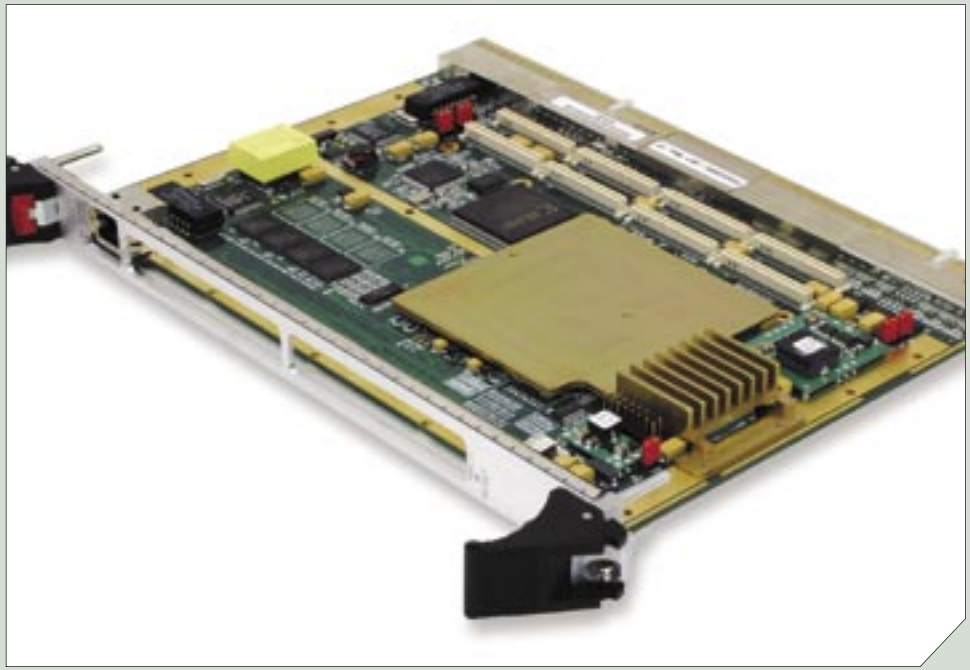
CompactPCI Intel

	Size (in Us)	System/ Peripheral	Processor Type & Speed	Maximum Memory	# PMC Slots	Bus Interface Chip	Ethernet	Serial I/O	Rugged Options	Transition Modules	Notes
CT9	6U	Both	Intel® Pentium® M Processor @ up to 1.8 GHz	Up to 2 GB DDR SDRAM (200) w/ECC	1, 2	PLX 6254	2x Gigabit Ethernet on the front (optional), 2x Gigabit Ethernet on the rear	2	Conv. Cooled, Ext. Temp	CTM12	Single slot, compliant to: Packet switching backplane, hot swap, IPMI
CT8	6U	Both	Ultra Low Voltage Intel® Pentium® III to 933 MHz	Up to 2 GB SDRAM (133 MHz) w/ECC	1, 2	PLX 6254	2x Gigabit Ethernet on the rear	2	Conv. Cooled, Ext. Temp	CTM12	Compliant to: Packet switching backplane, redundant system slot, hot swap, IPMI
CT7	6U	Both	Intel® Celeron® Processor @ 566 MHz, Intel® Pentium® III Processor @ 500-850 MHz, Low power CPUs	Up to 1 GB SDRAM w/ECC	1	Intel 21554	2x 10/100 Mb/s on front panel RJ45	2	Ext. Temp	CT7-TM, CTM10	Wide SCSI up to 40 MB/s
CR9	6U	Both	Intel® Pentium® M Processor @ up to 1.8 GHz	Up to 2 GB DDR SDRAM (200) w/ECC	1, 2	PLX 6254	2x Gigabit Ethernet on the front (optional), 2x Gigabit Ethernet on the rear	2	Cond. Cooled, Ext. Temp, Rugged	CTM12	Single slot, compliant to: Packet switching backplane and hot swap
CR7	6U	System	Intel® Celeron® Processor @ 566 MHz, Intel® Pentium® III Processor @ 500-1000 MHz, Low power CPUs	Up to 512 MB SDRAM w/ECC	1	Intel 21150	10/100 Mb/s	4	Cond. Cooled, Ext. Temp, Rugged	CTM6, CTM6A, CTM6C, CTM7	
CR3	3U	Both	Ultra Low Voltage Intel® Celeron® @ 400-650 MHz	128 MB SDRAM	0	PLX 6254	2x 10/100 Mb/s on the rear	2	Cond. Cooled	CR3-TM	Single slot, mouse/keyboard, Ethernet
CP9	6U	Both	Intel® Pentium® M Processor @ up to 1.8 GHz	Up to 2 GB DDR SDRAM (200) w/ECC	1, 2	PLX 6254	2x Gigabit Ethernet on the front (optional), 2x Gigabit Ethernet on the rear	2	Cond. Cooled, Ext. Temp, Rugged	CTM12	Single slot, compliant to: Packet switching backplane and hot swap
CL9	3U	System	Intel® Pentium® M Processor @ up to 1.8 GHz, Ultra Low Voltage Intel® Celeron® M @ 600 MHz	Up to 1 GB DDR SDRAM (333)	0	TI PCI2050B	2x Gigabit Ethernet on the front	2	Ext. Temp	CTM15	Options of 4 HP or 8 HP front panel width variations, two Serial ATA on rear
CL7	3U	System	Intel® Celeron® Processor @ 566 MHz	Up to 512 MB SDRAM	0	Intel 82810	10/100 Mb/s on front panel RJ45	2	Ext. Temp	CTM13	
CA3	3U	Both	Ultra Low Voltage Intel® Celeron® @ 400-650 MHz	Up to 256 MB SDRAM (100)	0	PLX 6254	2x 10/100 Mb/s one on the rear, one on the front	2	Conv. Cooled		Single slot, mouse/keyboard, Ethernet

CompactPCI PowerPC® | Designed for use in a broad spectrum of applications from military/aerospace to commercial and telecommunications systems, SBS PowerPC-based CPCI boards are available with diverse feature sets to accommodate the unique requirements of demanding real-time applications.

CompactPCI PowerPC

	Size (in Us)	System/ Peripheral	Processor Type & Speed	Maximum Memory	# PMC Slots	Bus Interface Chip	Ethernet	Serial I/O	Rugged Options	Transition Modules	Notes
CK5	6U	Both	Freescale 7447A G4 PowerPC (up to 1 GHz)	Up to 1 GB SDRAM w/ECC	2	PLX 6254	10/100 Mb/s	6	Cond. Cooled, Conv. Cooled	CK5-TM	Pin compatible upgrade to the CK3
CM4	3U	Both	Freescale 7410 500 MHz, IBM PPC 750 to 500 MHz	Up to 256 MB SDRAM w/ECC	1	PLX 6254	10/100 Mb/s	4	Cond. Cooled, Conv. Cooled	CM4-TM	5-bits discrete TTL I/O with interrupt capability
RL4	3U	System	Freescale MPC 755 @ 400 MHz, IBM PPC 750 to 500 MHz	128MB ECC DRAM	1	TI PCI2050B	10/100 Mb/s	4	Cond. Cooled, Ext. Temp	RLTM	



VMEbus Intel® | SBS offers advanced VMEbus single board computers using the latest Intel or compatible processor technology. VMEbus technology is still dominant in many embedded board markets and has proven itself to be a stable technology that evolves with the needs of those markets.

VMEbus Intel

	Size (in Us)	Processor Type & Speed	Maximum Memory	# PMC Slots	Bus Interface Chip	Ethernet	Serial I/O	Rugged Options	Transition Modules	Notes
VR9	6U	Intel® Pentium® M Processor @ up to 1.8 GHz	Up to 2 GB DDR SDRAM (200) w/ECC	1, 2	Tundra Universe IID	2x Gigabit Ethernet on the front (optional), 2x Gigabit Ethernet on the rear	2	Cond. Cooled, Ext. Temp	VTM21	Single slot, compliant to VITA 31.1
VR7	6U	Intel® Celeron® Processor @ 300-566 MHz, Intel® Pentium® III Processor @ 500-850 MHz, Low power CPUs	Up to 2 GB DDR SDRAM (200) w/ECC	1	Tundra Universe IID	2x Gigabit Ethernet on the front (optional), 2x Gigabit Ethernet on the rear	2	Ext. Temp	VTM11	SCSI Flash drive
VP9	6U	Intel® Pentium® M Processor @ up to 1.8 GHz	Up to 2 GB DDR SDRAM (200) w/ECC	2	Tundra Universe IID	2x Gigabit Ethernet on the front (optional), 2x Gigabit Ethernet on the rear	2	Ext. Temp	VTM21	Dual slot front panel, extensive front I/O functions, compliant to VITA 31.1
VP7	6U	Intel® Celeron® Processor @ 566 MHz, Intel® Pentium® III Processor @ 500-1000 MHz, Low power CPUs	Up to 1 GB SDRAM w/ECC	1	Tundra Universe II	10/100 Mb/s	4	Ext. Temp	VP6-TM	
V5C	6U	Intel® Pentium® III Processor @ 700-1000 MHz	Up to 1 GB DDR SDRAM (333)	0	Tundra Universe II	2x 10/100 Mb/s on front panel RJ45	2	Conv. Cooled	VME-TB21, VME-TB51	Front panel mouse/ keyboard port; Compact Flash

VMEbus PowerPC® | SBS complements its VME processor solutions with PowerPC-based 6U single board computers developed to meet the needs of demanding embedded applications.

VMEbus PowerPC

	Size (in Us)	Processor Type & Speed	Maximum Memory	# PMC Slots	Bus Interface Chip	Ethernet	Serial I/O	Rugged Options	Transition Modules	Notes
V2S	6U	Freescale 7447A G4 PowerPC (up to 1 GHz)	Up to 1 GB SDRAM w/ECC	1	Tundra Tsi148	2x Gigabit Ethernet on the rear	2	Cond. Cooled, Conv. Cooled	VXS1-TM	2eSST VMEbus
VG4	6U	Freescale 7410 500 MHz, Freescale MPC 755 @ 400 MHz, IBM PPC 750 500 MHz	Up to 512 MB SDRAM		Tundra Universe II	10/100 Mb/s	4	Cond. Cooled, Ext. Temp, Rugged	VGTM	Wide SCSI; Optional MIL-STD-1553
VG5	6U	Single/Dual Freescale MPC7455/57 @ 867 - 1267 MHz	Up to 512 MB SDRAM w/ECC	1, 2	Tundra Universe IID	2 10/100 Mb/s, Up to 2x Gigabit Ethernet	Single - 4, Dual - 6	Cond. Cooled, Ext. Temp, Rugged	VTM20	Asymmetrical Multi-Processing Architecture
VXS1	6U	Freescale 7447A G4 PowerPC (up to 1 GHz)	Up to 1 GB SDRAM w/ECC	1	Tundra Tsi148	2x Gigabit Ethernet on the rear	2	Cond. Cooled, Conv. Cooled	VXS1-TM	VITA 41; 2eSST VMEbus

PrPMC PowerPC® | Our Palomar Processor PMC card (PrPMC) maximizes flexibility with a modular approach to adding a processor to a host board. The PMC Card functions as a complete processor subsystem and can be used to control a carrier card, effectively making it into a Single Board Computer or blade. The processor module can be added to any system with an open PMC slot.

Processor PMC

	Processor Type & Speed	Maximum Memory	Bus Interface Chip	Ethernet	Serial I/O
Palomar 500	750 Cxe @ 400 MHz	Up to 1 GB SDRAM w/ECC	GT64260B	(1) 10/100 Mb/s w/front panel RJ45 or optionally	2

Processor AdvancedMC™ Intel® Pentium® M Processor | Our Processor AdvancedMC fully implements the AdvancedTCA® modular design concept. It brings a feature-rich processor capability to its carrier board, and can be added to any host card with the appropriate mechanical and electrical connections.

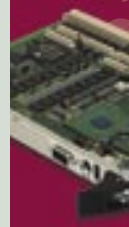
Processor AdvancedMC

	Processor Type & Speed	Maximum Memory	Chipset	Interconnect
Telum ASLP10	Intel® Pentium®M processor @ up to 2GHz	Up to 2GB DDR2-400 with ECC	Intel E7520	2x Gigabit Ethernet, PCI Express x8, 2x SATA

Industrial PC | SBS DINrail-mounted, industrial PCs offer a compact design and meet the needs of rugged applications with flexible I/O configuration options, shock/vibration immunity, and fanless operation. Stand-alone board versions without metal housings also available.

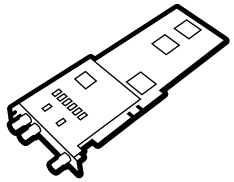
Industrial PC

	Dimensions (mm) (H x W x D)	Processor Type & Speed	Maximum Memory	PC/104+ Slots	Bus Interface Chip	Ethernet	Serial I/O	Rugged Options	Housing	Notes
EC6	119 x 210 x 40	Geode 333MHz	Up to 512 MB SDRAM	3	Geode CS5530A	2 10/100 Mb/s	4	Ext. Temp	Stand-alone Single Board Computer	CANbus; Parallel port, Opto-isolated I/O
PC6	125 x 220 x 83	Geode 333MHz	Up to 512 MB SDRAM	3	Geode CS5530A	2 10/100 Mb/s	2	Ext. Temp	Metal housing for DINrail mounting	CANbus; Parallel port; Opto-isolated I/O
PC7	145 x 229/242 x 92	Intel® Pentium® III Processor @ 700 MHz	Up to 256 MB SDRAM (100)	3	Intel 82810	10/100 Mb/s	4	Ext. Temp	Metal housing for DINrail mounting	CANbus; Parallel port; Opto-isolated I/O
PC7 Rugged	314.5 x 197.3 x 141	Intel® Pentium® III Processor @ 700 MHz	Up to 256 MB SDRAM (100)	3	Intel 82810	10/100 Mb/s	4	Ext. Temp	Rugged aluminum housing	CANbus; Parallel port; Opto-isolated I/O; IP65



FPGA COMPUTING uses Field Programmable Gate Array technology to offer embedded designers unparalleled flexibility and computing power by programming hardware for the specific functions an application requires.

FPGA Computing



FOR SOME APPLICATIONS, FPGA-BASED COMPUTING delivers order-of-magnitude performance increases. Our FPGA-based computing platforms feature one or more FPGAs acting as processing engines in a complete computing system capable of supporting algorithm-intensive, high-bandwidth applications with far less real estate, lower power, and less expense than existing multi-CPU or DSP systems.

FPGAs
Provide Real Time Video Compression on a PMC.

The processing muscle of the latest FPGAs, combined with SBS development tools, has allowed us to pack amazing video capabilities onto a single PMC. For example, a single SBS PMC can now perform multiple streams of MPEG4 compression at full video rates direct from your cameras to your network. The compressed video is then delivered across low bandwidth networks where SBS systems perform the decompression and display functions.

The micro-mezzanine front I/O panels on this highly adaptable PMC accepts a range of signal inputs which can be customized to meet your requirements. A range of applications benefit from this kind of video processing power, including manned and unmanned vehicles, security, industrial inspection and medical imaging.

SBS has made the process of integrating video easy with its powerful, easy-to-use development kits which include APIs, drivers, source code, application examples and more. Multiple operating systems are supported, and we also offer the SBS FPGA Accelerator Program which further simplifies the integration process.

TS-Series FPGA Processors | TS-Series Processor boards are the foundational element of SBS' FPGA Computing family. Each TS-Series board has an Altera® FPGA processor chip, a PCI interface, SRAM, SDRAM, an I/O module, and expansion slots for additional FPGA Computing power. These elements are interconnected by a high speed bus on the board.

TS Series

	Product Description	FPGA Component	Effective Gates	Form Factor	SRAM	SDRAM	Expansion Bays
TS-104-3001	TS Series FPGA-based PCI-104 processor for high performance computing solutions.	Altera Stratix EP1S30-7	30K Logic Elements	PCI-104	512K	256 MB	NA
TS-CPCI-8001	Ideal for software-defined radio, radar, sonar and other high performance signal processing applications.	Altera Stratix EP1S80-7	2 x 80K Logic Elements	CPCI	2 x 2MB	2 x 64MB	NA
TS-FX-2501	TS Series of FPGA Expansion Modules easily scale your application development with additional FPGA processors.	Altera Stratix EP1S25-7	25K Logic Elements	Other	1MB	256 MB	NA
TS-FX-4001	TS Series of FPGA Expansion Modules easily scale your application development with additional FPGA processors.	Altera Stratix EP1S40-5	40K Logic Elements	Other		348 MB	NA
TS-PCI-2501	TS-Series of FPGA Processors easily scale your application development with additional FPGA processors.	Altera Stratix EP1S25-7	25K Logic Elements	PCI	1MB	256 MB	4
TS-PCI-4001	TS Series of FPGA Processor is our highest performance PCI based FPGA processor for COTS and OEM applications.	Altera Stratix EP1S40-5	40K Logic Elements	PCI	4MB	1 GB	2
TS-PMC-3001	TS Series of FPGA Processors, the PMC A30 commercial grade is ideal for signal pre-processing, video, compression, software defined radio, radar, sonar and applications .	Altera Stratix EP1S30-7	30K Logic Elements	PMC	2 x 2MB	2 x 128MB	NA
TS-PMC-4001	TS Series of FPGA Processors the PMC A40 commercial grade is ideal for signal pre-processing, video, compression, software defined radio, radar, sonar and applications	Altera Stratix EP1S40-5	40K Logic Elements	PMC	2 x 2MB	2 x 128MB	NA
TS-PMC-4002	TS Series of FPGA Processors the PMC A40 conduction cooled is ideal for signal pre-processing, video, compression, software defined radio, radar, sonar and applications .	Altera Stratix EP1S40-I6	40K Logic Elements	PMC	2 x 2MB	2 x 128MB	NA

I/O Modules | Customize your FPGA Computing design with I/O modules, which provide flexibility in the face plate connectors and transmission protocols available for use with the TS-Series processing board.

I/O Modules

	Product Description	I/O Connectors
TS-IX-CL01	Camera Link mezzanine I/O board for the TS Series of FPGA processors, configured for full mode Camera Link operation.	Two MDR 26
TS-IX-CL02	TS-Camera Link mezzanine I/O board for the TS Series of FPGA processors, configured for full mode Camera Link operation.	Two MDR 26
TS-IX-GP01	TS-General Purpose I/O mezzanine provides serial and parallel connection to the TS Series of FPGA Processors.	4 @ 13 pin 0.1", 4 @ 20 pin 0.01" Header Connecto
TS-IX-LV01	LVDS mezzanine I/O for the TS-Series PMC offers flexibility of front panel connection.	One 68-pin 0.050" SCSI-2 connector
TS-IX-RS01	RS-170 Air Cooled Micro Mezzanine I/O for the TS- Series of FPGA PMC offers flexibility of rear panel connection.	I/O via PMC P4 connector only

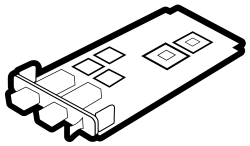
Development Kits and Software | The TS-Series Development Kit provides all the software and documentation required to quickly program your applications on the TS-Series platform. This includes the TS-Series PCI board, Wave FPGA Software, Altera® Quartus® Software, SOPC Builder, NIOS® Software, TS-Series Users Guide and Programmers Guide.

Development Kits & Software

	Product Description	Configuration/ Description	FPGA Component	Form Factor	SRAM	SDRAM
TS-CX-0001	TS-'C' Development Kit provides the Celoxica's DK Design Suite-C development tools with SBS TS-Series of FPGA computing platform for fast time to market and immediate realization of C algorithms on Altera Stratix FPGAs.	Celoxica DK Design Suite licensed for dedicated TS-Series use, Users Guide for Handel-C in Digital Signal Processing, full documentation and tutorials	N/A	6U CPCI, CPCI, PCI, PCI-104, PMC	N/A	N/A
TS-DK-CPC01	TS-6U CPCI A80 Development Kit gets your software-defined radio, radar, sonar and other high performance signal processing applications up and running quickly on our revolutionary FPGA computing platform.	TS-6U CPCI commercial board, Wave FPGA Software Tool Kit, Altera Quartus, SOPC and Nios software, documentation and cables	Altera Stratix EP1S80-7	CPCI	2 x 2MB	2 x 64MB
TS-DK-GP01	TS Series General Purpose Development Kit gets you up and running quickly on our revolutionary FPGA computing platform.	TS-PCI A25 board, general purpose mezzanine I/O, Wave FPGA Software Tool Kit, Altera Quartus, SOPC and Nios software, documentation and cables	Altera Stratix EP1S25-7	PCI	1MB	256 MB
TS-DK-GP02	TS Series PCI FPGA Processor highest performance Development Kit gets you up and running quickly on our revolutionary FPGA computing platform.	TS-PCI A40 board, general purpose mezzanine I/O, Wave FPGA Software Tool Kit, Altera Quartus, SOPC and Nios software, documentation and cables	Altera Stratix EP1S40-5	PCI	4MB	1 GB
TS-DK-GP03	TS-PCI-104 Development Kit combined with SOPC Builder, Avalon Bus architecture and Nios soft-core processor package allows for a flexible and scalable architecture.	TS-PCI-104 Board, Wave FPGA Software Tool Kit, Altera Quartus, SOPC and Nios software, documentation and cables	Altera Stratix EP1S30-7	PCI-104	1MB	256 MB
TS-DK-IT01	TS-Camera Link Development Kit provides an easy to use Camera Link interface and Wave Imaging Toolkit on a powerful FPGA-based computing platform.	TS-PCI A25 board, Camera Link interface, Wave Imaging Software Tool Kit, Altera Quartus, SOPC and Nios software, documentation and cables	Altera Stratix EP1S25-7	PCI	1MB	256 MB
TS-DK-IT02	TS-PCI A40 Imaging Development Kit is the highest performance PCI-based Camera Link Development Kit providing an easy to use Camera Link interface and Wave Imaging Toolkit on a powerful FPGA-based computing platform.	TS-PCI A40 board, Camera Link interface, Wave Imaging Software Tool Kit, Altera Quartus, SOPC and Nios software, documentation and cables	Altera Stratix EP1S40-5	PCI	4MB	1 GB
TS-DK-PMC01	TS-PMC A40 General Purpose Development Kit provides an easy-to-use environment, giving developers full access to SBS FPGA resources with minimum effort.	TS-PMC A40 commercial board, TS-LVDS Mezzanine I/O, Wave FPGA Software Tool Kit, Altera Quartus II, SOPC and Nios software, documentation and cables	Altera Stratix EP1S40-5	PMC	2 x 2MB	2 x 128MB
TS-DK-PMC02	TS-PMC Video Development Kit provides an easy-to use environment, giving developers full access to TS Series resources with minimum effort.	TS-PMC commercial board, TS-RS170 Video Mezzanine I/O, Wave FPGA Software Tool Kit, Altera Quartus II, SOPC and Nios software, documentation and cables	Altera Stratix EP1S40-5	PMC	2 x 2MB	2 x 128MB
TS-DK-SDR1	TS-6U CPCI Development Kit is integrated with Red River 309 A/D PMC and 919 D/A modules, making this an ideal platform for development of Software Defined Radio (SDR) applications.	TS-6U CPCI A80 commercial board, Wave FPGA Software Tool Kit, Altera Quartus II, SOPC and Nios software, Red River Dual DAC 919 Mezzanine card, 309 Flex Receiver A/D PMC, documentation and cables	Altera Stratix EP1S80-7	CPCI	2 x 2MB	2 x 64MB
TS-DK-SDR2	TS-6U CPCI Development Kit is integrated with Red River 309 A/D PMC and 919 D/A modules, CT8 SBC and a 6U chassis, making it an ideal solution for development of Software Defined Radio (SDR) applications.	TS-6U CPCI commercial board, Wave FPGA Software Tool Kit, Altera Quartus II, SOPC and Nios software, Red River Dual DAC 919 Mezzanine card, 309 Flex Receiver A/D PMC, SBS CT4 SBC, 6U CPCI Chassis and power supply, documentation and cables	Altera Stratix EP1S80-7	CPCI	2 x 2MB	2 x 64MB

SBS designs and builds a broad selection of industry leading I/O & COMMUNICATIONS products available both independently and as a complement to our system solutions. SBS I/O cards and modules are designed to serve a multitude of applications across the commercial, communication and government markets.

I/O & Communications



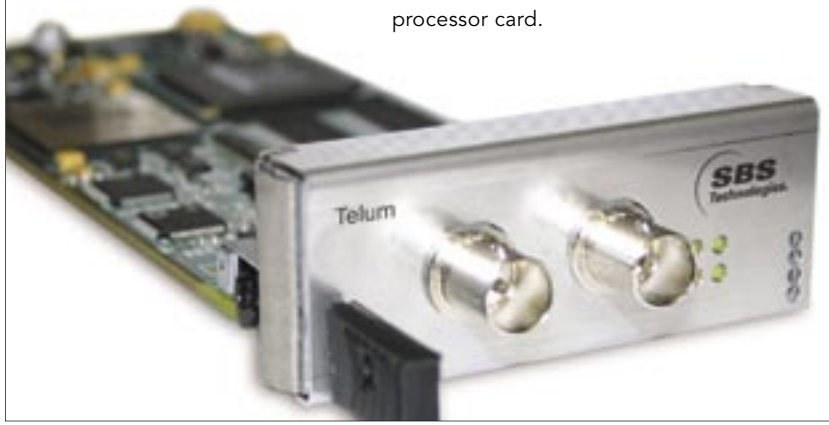
THE COMMUNICATIONS AND NETWORKING MARKETPLACE is incredibly dynamic and fast-paced, and SBS continually enhances and complements its product offerings through ongoing research and development in advanced and emerging technologies. We have established a leadership position in AdvancedMC™ products, with a wide range of new modules and an extensive roadmap of products in development for telecom, networking and storage applications.

AdvancedMC™

SBS TAKES A LEADERSHIP ROLE.

The mezzanine card has long been a popular way to add capabilities to a carrier board. And now that mezzanine cards are available for Advanced Telecom Computing Architecture (AdvancedTCA®) systems, they are delivering tremendous benefits to system designers. These AdvancedTCA mezzanines are known as AdvancedMC™ cards and SBS has made a strong commitment to the standard.

With the introduction of the Telum® line of AdvancedMC modules, SBS has taken a leadership position in this new form factor. Already, we have introduced nearly a dozen Telum cards which feature an array of I/O capabilities such as Gigabit Ethernet, Fibre Channel, DS3/E3, T1/E1/J1, OC-3, OC-12. We also offer a video module and a processor card.



AdvancedTCA®: IT'S HERE AND IT'S FAST.

The Advanced Telecom Computing Architecture (AdvancedTCA) was created by the PCI Industrial Computer Manufacturers Group (PICMG®) as an open carrier board, backplane, mezzanine card and software specification designed for the next generation of telecommunications and data center equipment. The principle objective of AdvancedTCA is to provide a standardized platform architecture for carrier-grade telecommunication and data center applications.

AdvancedMC modules provide an expansion interface for AdvancedTCA blades that increases system flexibility, scalability and cost efficiency. Because an AdvancedMC module is hot-swappable, the card can be quickly exchanged in the field, allowing a technician to easily replace only the malfunctioning portion of an AdvancedTCA blade, instead of the whole blade, thus reducing system downtime and operating costs.

MORE OPTIONS FOR SYSTEM DESIGNERS

Designers can build modular, flexible systems that can be easily upgraded by replacing an old mezzanine board with a newer design without changing the basic system architecture. Depending upon the particular design of a mezzanine, I/O can be routed through the module's front bezel or the backplane.

THE UPGRADE PATH

Single and dual processor processor mezzanine cards allow designers to upgrade systems with the fastest processors, exponentially increasing the raw processing performance of the systems. While mezzanines do add somewhat to the cost and complexity of system boards, they also provide insurance against obsolescence. Those who build their large system boards by locking down all of the SCSI and Ethernet protocols, for example, have limited flexibility and may find their product quickly rendered obsolete.

However, by putting mezzanine slots down on boards, designers can easily swap in new functions as required, extending the useful life of systems. Because mezzanine cards enable a large variety of products and functions to be easily targeted to multiple bus platforms, they enable designers to customize systems using off-the-shelf components. This minimizes engineering efforts and funds and reduces the length of the development cycle and time to market. And with mezzanines, what used to require a huge, multi-slot rack of boards can often be implemented in a single board or a few main boards coupled with a selection of mezzanines.

InfiniBand® Data Communications Switches | Designed to comply with the latest InfiniBand standard, SBS InfiniBand products are ideal for data center applications needing to move large amounts of data at high speeds.

InfiniBand Data Communications Switches

	Data Ports	Link Configuration	Chassis	Hot Swappable Power Supplies	Hot Swappable Fans	Optical Enabled
EIS-4024-1U	24	4x	rackmount	2	yes	
EIS-4024-1UA	24	4x	rackmount	2	yes	Yes
EIS-4144-10U	144	4x	rackmount	2	yes	Available
IB4X-V41-AC*	24	4x	VITA 41 form factor board; convection cooled			
IB4X-V41-CC**	24	4x	VITA 41 form factor board; conduction cooled			
* Convection cooled ** Conduction cooled						
Other SBS Infiniband Products						
IB4X-LPCIX-KIT	Starter kit includes 1 EIS-4024-1U switch, 3 IB4X-LPCIX-2 HCAs & 3 IB4X-3 3-meter cables					
IB4X-OMC	4-channel media converter for SBS optical enabled HCAs and switches					
IB4X-PMC-KIT	Starter kit includes 1 EIS-4024-1U switch, 3 IB4X-PMC-2 HCAs & 3 IB4X-3 3-meter cables					
IB4X-VXWORKS	InfiniBand software for VxWorks					

InfiniBand® Host Channel Adapters | SBS offers the advantages of high-speed InfiniBand technology to the world of embedded computing. These Host Channel Adapters (HCAs) are ideal for embedded applications that need high-speed, low latency data movers.

InfiniBand Host Channel Adapters

	Form Factor	Ports	Configuration/ Description	Silicon	Interface	Optical Enabled
IB4X-CPCI-2A	3U CPCI, 6U CPCI front panel	2	1x or 4x	Mellanox InfiniHost	32/64-bit/66 MHz, 3.3V	Yes
IB4X-LPCIEXP-2	Low Profile PCI Express	2	1x or 4x	Mellanox InfiniHost III	8x PCI Express	Available
IB4X-LPCIX-2	Low Profile PCI-X	2	1x or 4x	Mellanox InfiniHost	32/64-bit/133 MHz, 3.3V	
IB4X-LPCIX-IRIX*	Low Profile PCI-X	2	1x or 4x	Mellanox InfiniHost	32/64-bit/133 MHz, 3.3V	
IB4X-LPCIX-2A	Low Profile PCI-X	2	1x or 4x	Mellanox InfiniHost	32/64-bit/133 MHz, 3.3V	Yes
IB4X-PCIX-2	PCI-X	2	1x or 4x	Mellanox InfiniHost	32/64-bit/133 MHz, 3.3V	
IB4X-PMC-2A	PMC	2	1x or 4x	Mellanox InfiniHost	32/64-bit/133 MHz, 3.3V	Yes

*Legend: * Firmware modified for IRIX CDI; IRIX CDI driver licensed with HCA*

VITA 41. Forward Looking.
Backward Compatible.

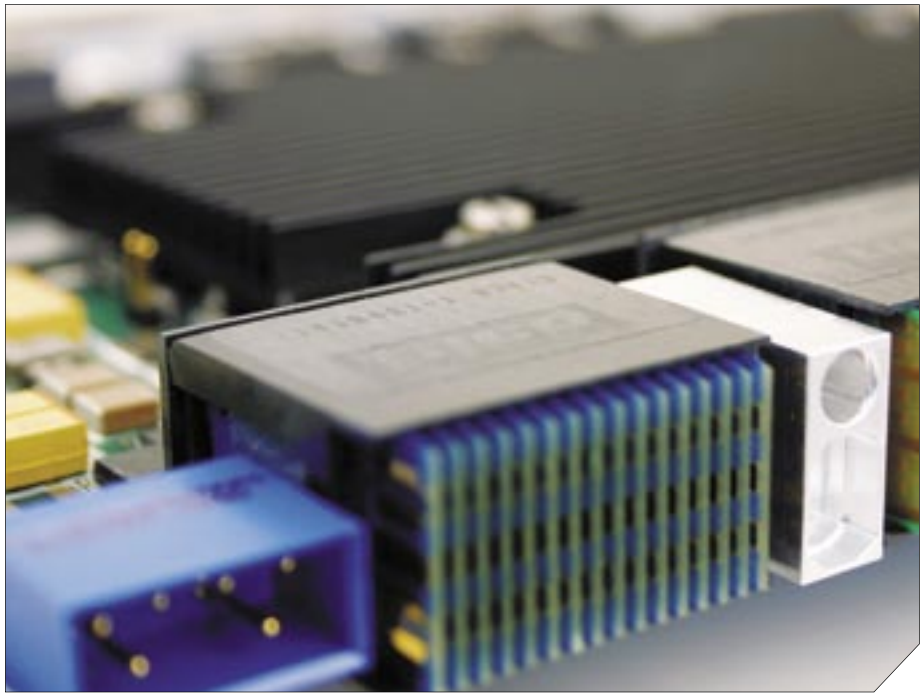
Now that switched fabrics have been added to the backplane, VME is set to defend its turf for some time, which is good news if you own VME boards. VITA 41, VME's switched fabric specification, maintains the classic VME pin-out but adds a new high-speed connector to P0 in the payload slots. It's a simple solution that preserves your investment, and it works today with components available from SBS.

SBS is a well-known supporter of VME. Our commitment to the standard is deep and wide, including numerous single board computers, I/O options, software support packages and a full range of integrated systems. So it is only natural for us to integrate switched fabrics into our extensive list of VME product offerings.

VITA 41 supports 4x InfiniBand traffic, which transmits data at 10 Gb/s. And the switched fabric enables multiple transmissions across the backplane which allows several VME cards to transmit data concurrently. The SBS InfiniBand VITA 41 switch offers an aggregate bandwidth of 480 GB/s. SBS has implemented VITA 41 with InfiniBand in order to take advantage of the incredible speed, reliability and availability of InfiniBand components. InfiniBand technology has become a standard for high-speed clustered computing, and has proven itself in the real world. It brings all these known advantages to the trusty VME bus and provides a clear migration path into the future. The SBS InfiniBand switch provides all the hardware and software you will need to effortlessly carry your VME investments forward into the era of high-speed fabrics.

PRODUCTS:

SBS offers two new VITA 41 boards: the IB4X-V41 InfiniBand Fabric Switch and the VXS1 Single Board Computer. The 24 port, 4x, non-blocking, fully-managed switch is hot swappable and available with convection or conduction cooling. The VXS1 single board computer features a Motorola® G4 PowerPC processor with 167 MHz system and memory buses. It has a PMC expansion slot, 512 MB of DDR SDRAM and a Discovery™ III bridge chip. With two independent 4x InfiniBand links to the VME backplane, it provides both InfiniBand connectivity and can function as a VME bus controller.



Fibre Channel Host Bus Adapters | Based on a 64-bit/66 MHz bus architecture, SBS 1-Gigabit and 2-Gigabit Fibre Channel host bus adapters and supporting software tools provide high sustained throughput, low latency, and industry standard multi-node connectivity.

Fibre Channel Host Bus Adapters

	Bit Rate (Gb/s)	Form Factor	Half-Duplex Rate (MB/s)	Full-Duplex Rate (MB/s)	Media	Ports	3-Port Hub	Concurrent Operation Support	PCI Dual Address Cycle & Cache Command Support	Multi-ID Aliasing	Conduction Cooled
Telum FC2312-FF	2	AMC	200	400	Fiber	2 Fiber		2 nodes	yes	yes	
Telum FC2312-CC	2	AMC	200	400	Copper	2 HSSDC		2 nodes	yes	yes	
FC2312-PMC-FF	2	PMC	200	400	Fiber	2 Fiber		2 nodes	yes	yes	
FC2312-PMC-CC	2	PMC	200	400	Copper	2 HSSDC		2 nodes	yes	yes	
FC23-PMC-1F	2	PMC	200	400	Fiber	1 Fiber					
FC23-PMC-1C	2	PMC	200	400	Copper	1 HSSDC					
FC22A-PMC-FF	1	PMC	102.7	200	Fiber	2 Fiber	yes				
FC22A-PMC-CF	1	PMC	102.7	200	Copper, Fiber	1 HSSDC, 1 Fiber	yes				
FC22A-PMC-CC	1	PMC	102.7	200	Copper	2 HSSDC	yes				
FC22A-PMC-1F	1	PMC	102.7	200	Fiber	1 Fiber					
FC22A-PMC-1C	1	PMC	102.7	200	Copper	1 HSSDC					
FC22A-PCI-FF	1	PCI	102.7	200	Fiber	2 Fiber	yes				
FC22A-PCI-CF	1	PCI	102.7	200	Copper, Fiber	1 HSSDC, 1 Fiber	yes				
FC22A-PCI-CC	1	PCI	102.7	200	Copper	2 HSSDC	yes				
FC22A-PCI-1F	1	PCI	102.7	200	Fiber	1 Fiber					
FC22A-PCI-1C	1	PCI	102.7	200	Copper	1 HSSDC					
FC22A-CCPMC-1C	1	PMC	102.7	200	Copper	1 Micro Dsub					yes

Gigabit Ethernet Switches | 3U and 6U CPCI switches provide maximum flexibility for applications that require both Layer-2 managed as well as advanced Layer-2 and Layer-3 routing functionality. Switches are available for conduction cooled and air cooled rugged environments.

Gigabit Ethernet Switches

	Form Factor	Ethernet Switch	PICMG Compliance	Processor	Memory	Hot Swap	I/O Interface
CP3-GESW12M3	3U CPCI	10-Port Gigabit Ethernet; Layer 2 & 3 managed	N/A	MPC8245			10BaseT, 100BaseTx, 1000BaseT
CP3-GESW12M3N*	3U CPCI	10-Port Gigabit Ethernet; Layer 2 & 3 managed	N/A	MPC8245			10BaseT, 100BaseTx, 1000BaseT
CP3-GESW12M3R**	3U CPCI	10-Port Gigabit Ethernet; Layer 2 & 3 managed	N/A	MPC8245			10BaseT, 100BaseTx, 1000BaseT
CP3-GESW8	3U CPCI	8-port Gigabit Ethernet; unmanaged	N/A	N/A	1 MB total Packet Buffer Memory		10/100/1000BaseT; One front & 7 rear panel ports
CP3-GESW8-TM8	3U CPCI	Rear-panel I/O Transition Module					
CP3-GESW8N*	3U CPCI	8-port Gigabit Ethernet; unmanaged	N/A	N/A	1 MB total Packet Buffer Memory		10/100/1000BaseT; 8 rear panel ports
CP6-GESW24M3	6U CPCI	24-Port Gigabit Ethernet; managed	2.1, 2.16	MPC8245		yes	10/100/1000BaseT Ethernet line speed switching
CP6-GESW24M3N*	6U CPCI	24-Port Gigabit Ethernet; managed	2.1, 2.16	MPC8245		yes	10/100/1000BaseT Ethrnet line speed switching
CP6-GESW24M3R**	6U CPCI	24-Port Gigabit Ethernet; managed	2.1, 2.16	MPC8245		yes	10/100/1000BaseT Ethernet line speed switching
CP6-GIGSW8-C1AA	6U CPCI	8-port Gigabit Ethernet; unmanaged	N/A	Altera NIOS embedded processor	512 KB Data Packet Memory	yes	Two 4-port copper physical interface modules; 10/100/1000BaseT
CP6-GIGSW8-C1AB	6U CPCI	8-port Gigabit Ethernet; unmanaged	N/A	Altera NIOS embedded processor	512 KB Data Packet Memory	yes	One 4-port copper (10/100/1000BaseT) and one 4-port fiber-optic (1000BaseSX) physical interface module
CP6-GIGSW8-C1BB	6U CPCI	8-port Gigabit Ethernet; unmanaged	N/A	Altera NIOS embedded procssor	512 KB Data Packet Memory	yes	Two 4-port fiber-optic physical interface modules: (1000BaseSX)
CP6-GIGSW8-P1AA	6U CPCI	8-port Gigabit Ethernet; unmanaged	N/A	N/A	512 KB Data Packet Memory		Two 4-port copper physical interface modules; 10/100/1000BaseT
CP6-GIGSW8-P1AB	6U CPCI	8-port Gigabit Ethernet; unmanaged	N/A	N/A	512 KB Data Packet Memory		One 4-port copper (10/100/1000BaseT) physical interface module and one 4-port fiber-optic (1000BaseSX) physical interface module
CP6-GIGSW8-P1BB	6U CPCI	8-port Gigabit Ethernet; unmanaged	N/A	N/A	512 KB Data Packet Memory		Two 4-port fiber-optic physical interface modules; 1000BaseSX

*Legend: * Conduction Cooled, ** Rugged Air-Cooled*

Gigabit Ethernet Interfaces | SBS offers both PMC and AdvancedMC Gigabit Ethernet cards. Our single-wide PMCs relieve bandwidth bottlenecks and allow rapid incorporation of Gigabit Ethernet technology in CPCI and VME applications requiring high-bandwidth system interconnections. Our AdvancedMCs offers these same advantages for even higher bandwidth AdvancedTCA systems.

Gigabit Ethernet Interfaces

	Media	Interface	# Channels	Front Panel I/O Connectors	Rear Panel I/O Connectors	PCI Controller/ Ethernet MAC	Ethernet PHY
PMC-GBIT-DF2AA	Fiber	1000BaseSX	2	LC multi-mode		Intel 82546	Intel 82546
PMC-GBIT-DF2BB	Fiber	1000BaseLX	2	LC single-mode		Intel 82546	Intel 82546
PMC-GBIT-DT2BP*	Copper	10BaseT/100BaseTX/1000BaseT	2		RJ45	Intel 82546	Intel 82546
PMC-GBIT-DT2CC**	Copper	10BaseT/100BaseTX/1000BaseT	2		RJ45	Intel 82546	Intel 82546
PMC-GBIT-SF2A	Fiber	1000BaseSX	1	LC multi-mode		Intel 82545	Intel 82545
PMC-GBIT-SF2B	Fiber	1000BaseLX	1	LC single-mode		Intel 82545	Intel 82545
PMC-GBIT-SF2D	Fiber	1000BaseSX	1	SC multi-mode		Intel 82545	Intel 82545
PMC-GBIT-SF2E	Fiber	1000BaseLX	1	SC single-mode		Intel 82545	Intel 82545
PMC-GIGABIT-DT2	Copper	10BaseT/100BaseTX/1000BaseT	2		RJ45	Intel 82546	Intel 82546
PMC-GIGABIT-ST3	Copper	10BaseT/100BaseTX/1000BaseT	1	RJ-45		Intel 82545	Intel 82545
Telum GE-QT***	Copper	10BaseT/100BaseTX/1000BaseT	4	RJ-45	RJ45		
Other Products							
VD-FOE	Port failover software for Gigabit Ethernet NICs using VxWorks						

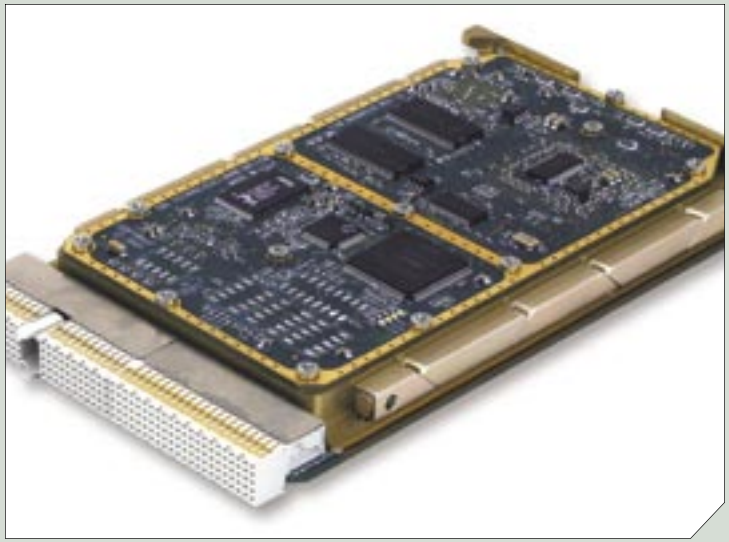
*Legend: * Requires PIM-GBIT-DT 20, ** Requires PIM-GBIT-DT; Conduction Cooled, *** AdvancedMC form factor*

Fast Ethernet | Engineered to industry standards, SBS Fast Ethernet interfaces facilitate rapid expansion of 10/100 Mbit Ethernet capability into PCI, CompactPCI and other embedded computing applications. Available in a variety of form factors and configurations, these communication interfaces provide system designers the flexibility to customize I/O configurations that offer the price and time-to-market advantages of off-the-shelf products.

Fast Ethernet

	Form Factor	Interface	# Channels	Front I/O	Rear I/O	Hot Swap	Conduction Cooled	PCI Bus Interface	Ethernet Controller
CP3-QUAD100TX	3U CPCI	10BaseT/100BaseTX	4	yes		yes		64-bit/66 MHz	Intel 82559ER
PMC-100BT-FP	Single-wide PMC	10BaseT/100BaseTX	1	yes				32-bit/33 MHz	Intel 82559ER
PMC-3101-BP2	Single-wide PMC	10BaseT/100BaseTX	2		yes			32-bit/33 MHz	Intel 82559ER
PMC-3101-BP2-CC*	Single-wide PMC	10BaseT/100BaseTX	2		yes		yes	32-bit/33 MHz	Intel 82559ER
PMC-3101-FP2	Single-wide PMC	10BaseT/100BaseTX	2	yes				32-bit/33 MHz	Intel 82559ER
PMC-3102	Single-wide PMC	10BaseT/100BaseTX connection tap	1	yes				32-bit/33 MHz	Intel 82559ER
PMC-3104-BP2	Single-wide PMC	10BaseT/100BaseTX	4		yes			32-bit/33 MHz	AM79C975
PMC-3104-FBR	Single-wide PMC	100Base-FX	4	yes				32-bit/33 MHz	AM79C975
PMC-3104-FP	Single-wide PMC	10BaseT/100BaseTX	4	yes				32-bit/33 MHz	AM79C975

*Legend: * Conduction Cooled, ** Rugged Air-Cooled*



WAN Sync Serial Interface Modules | SBS offers a broad selection of Synch Serial Wide Area Network (WAN) adapters ranging from single to octal port configurations with software programmable interfaces. This product line is complemented by a wide array of drivers and a comprehensive Driver Development Kit (DDK) to facilitate product integration.

WAN Sync Serial Interface Modules

	Interface	Form Factor	Protocol	# Full Duplex Ports	Product Description	Drivers
MAXIM 524-R & Quad Port RTM	Sync Serial	PMC	HDLC	4	Programmable interfaces (RS-232, EIA-530, V.35, and X.21), Rear panel I/O, CPCI Rear Transition Module (RTM)	2, B, D, L, S, V, W, X*
MAXIM 524-SE	Sync Serial	PMC	HDLC	4	Programmable interfaces (RS-232, EIA-530, V.35, and X.21)	2, B, D, L, S, V, W, X*
WANic 521/522-SE	Sync Serial	PCI	HDLC	1/2	Programmable interfaces (RS-232, EIA-530, V.35, and X.21)	2, B, D, L, S, V, W, X*
WANic 604/608-SE	Sync Serial	PCI	HDLC	4/8	Programmable interfaces (RS-232, EIA-530, V.35, and X.21)	2, D, L, V, W

*Legend: L=Linux, 2=Windows 2000, W=Windows NT, X= Windows XP, V=VXWorks, S= Solaris, B=FreeBSD, D=Driver Development Kit (DDK), *=planned*

WAN DS3/E3 Interface Modules | SBS Technologies' DS3/E3 product offerings support clear channel, fractional and channelized T3/E3 telecom applications. Supported protocols include HDLC, ATM, and TDM. The product line features high-end adapters for line-rate constant small packet transfers, as well as cost effective adapters for access/edge applications. This product line is complemented by a wide array of drivers and a comprehensive Driver Development Kit (DDK) to facilitate product integration.

WAN DS3/E3 Interface Modules

	Interface	Form Factor	Protocol	# Full Duplex Ports	Product Description	Drivers
Telum 1001-DE	DS3/E3	AMC	ATM	1	4MB Local SAR Memory, Local CSU/DSU	D, L, V,
WANic 1001-DE	DS3/E3	CPCI	ATM	1	2/4 MB Local SAR Memory, Programmable interface	2, D, L, V, X*
WANic 1001-DEM	DS3/E3	PCI-X	ATM	1	Monitoring Adapter with Auto Discovery & PDU Timestaping	D
WANic 521/522-DS	DS3	PCI	HDLC	1/2	Local CSU/DSU	2, B, D, L, S, V, W, X*
WANic 521/522-E3	E3	PCI	HDLC	1/2	Local CSU/DSU	2, B, D, L, S, V, W, X*
WANic 721/722-DS	DS3	PCI	HDLC	1/2	i960HD RISC Processor based, Local CSU/DSU	D, V
WANic 721/722-E3	E3	PCI	HDLC	1/2	i960HD RISC Processor based, Local CSU/DSU	D, V

*Legend: L=Linux, 2=Windows 2000, W=Windows NT, X= Windows XP, V=VXWorks, S= Solaris, B=FreeBSD, D=Driver Development Kit (DDK), *=planned*

Comprehensive WAN product line.

Not only does SBS offer a full WAN product line-up, but our product selection provides excellent line performance, software support, telecom line interface products and complete telecom channelization interfaces.

LINE PERFORMANCE:

SBS offers everything from sync serial to OC-12 full duplex line rate performance. The WANic (PCI), Maxim (PMC), and Aries (cPCI) has the most complete interface I/O coverage of any other WAN company. From multi-port sync serial to T1/E1/J1 and DS3/E3 HDLC Frame interfaces through DS3/E3, OC-3 and OC-12 ATM interfaces. Our new family of AdvancedMC Modules, the Telum family which is currently being introduced to the market, will also have the most comprehensive I/O interface coverage in the industry.

SOFTWARE SUPPORT:

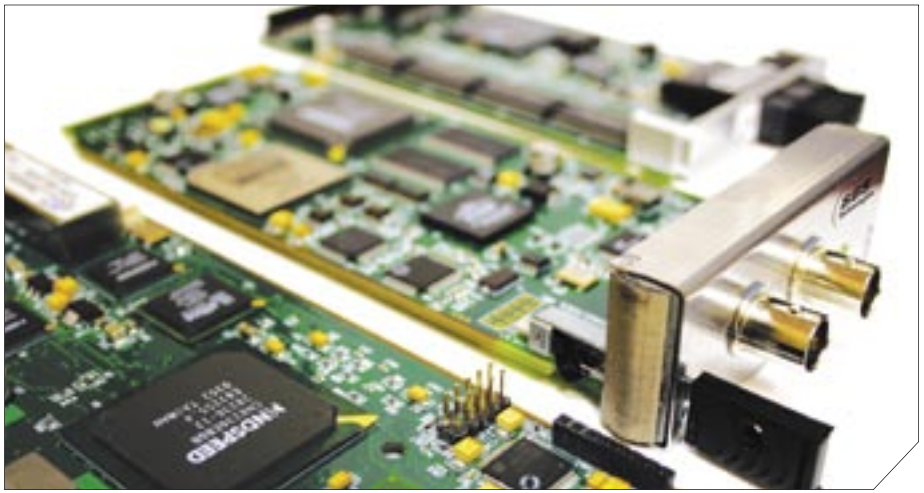
We offer fully compatible Driver Development Kits (DDKs) within family product lines (e.g., 520 family of products). The DDK package is a mature software package which allows you to get your application to market quickly. The basic DDK architecture is very mature and supports many different types of operating systems along with diagnostics to help introduce you to the product very quickly. If another WAN I/O interface is added within the same product family, the DDK allows this integration to happen seamlessly.

TELECOM LINE INTERFACES:

Our products have on-board a CSU/DSU Subsystem to alleviate the host of network line management tasks. Telecom line interface products such as T1/E1/J1 and DS3/E3 HDLC Frame and ATM interface products have local, on-board, CSU/DSU network line management. This subsystem is line compliant for FDL, line statistics, and other CSU operations. The DDK supports a command / data message passing mechanism to support this subsystem between the WAN I/O board and the host.

TELECOM CHANNELIZATION INTERFACES:

SBS offers T1, E1, J1 and DS3 products, and our WAN I/O products support channelized operation for T1, E1, J1, and DS3 network line interfaces. These products incorporate multi-channel HDLC controllers to give access to individual T1/E1/J1 lines or individual DS0 time slots.



WAN T1/E1/J1 Interface Modules | The T1/E1/J1 interface product line offers multiple application-specific features for cost-effective Telecom solutions. Supported protocols include HDLC, ATM, and IMA. The product line features line-compliant interfaces, a variety of data processing modes, and local CSU/DSU network line management subsystems. This product line is complemented by a wide array of drivers and a comprehensive DDK to facilitate product integration.

WAN T1/E1/J1 Interface Modules

	Interface	Form Factor	Protocol	# Full Duplex Ports	Product Description	Drivers
MAXIM 1001-TEJ 2MB	T1/E1/J1	PMC	ATM/IMA	4	Support for IMA, Programmable interface	2, D, L, V, X*
MAXIM 524-E1	E1	PMC	HDLC	4	Front panel I/O, Local CSU/DSU, Clear channel access	2, B, D, L, S, V, W, X*
MAXIM 524-E1R	E1	PMC	HDLC	4	Rear panel I/O, cPCI RTM, Local CSU/DSU, Clear channel access	2, B, D, L, S, V, W, X*
MAXIM 524-T1	T1	PMC	HDLC	4	Front panel I/O, Local CSU/DSU, Clear channel access	2, B, D, L, S, V, W, X*
MAXIM 524-T1R	T1	PMC	HDLC	4	Rear panel I/O, cPCI RTM, Local CSU/DSU, Clear channel access	2, B, D, L, S, V, W, X*
MAXIM 600-R	T1/E1	PMC	HDLC	4	Rear panel I/O, cPCI RTM, Local CSU/DSU, Channelization capable	2, D, L, V, W
TELUM 624/628-TEJ	T1/E1/J1	AMC	HDLC	4/8	128/256 DSO Channels, Local CSU/DSU	D, L, V
WANic 1004/1008	T1/E1	PCI-X	ATM/IMA	4/8	ATM/IMA Network monitoring adapter	D
WANic 521/522-E1	E1	PCI	HDLC	1/2	Local CSU/DSU, Clear channel access	2, B, D, L, S, V, W, X*
WANic 521/522-T1	T1	PCI	HDLC	1/2	Local CSU/DSU, Clear channel access	2, B, D, L, S, V, W, X*
WANic 604/608-E1	E1	PCI	HDLC	4/8	Local CSU/DSU, Channelization capable, DSX interface	2, D, L, V, W
WANic 604/608-E1P32	E1	PCI	HDLC	4/8	Local CSU/DSU, Clear channel access, DSX interface	2, D, L, V, W
WANic 604/608-T1	T1	PCI	HDLC	4/8	Local CSU/DSU, Channelization capable, DSX interface	2, D, L, V, W
WANic 604/608-T1P32	T1	PCI	HDLC	4/8	Local CSU/DSU, Clear channel access, DSX interface	2, D, L, V, W

*Legend: L=Linux, 2=Windows 2000, W=Windows NT, X= Windows XP, V=VXWorks, S= Solaris, B=FreeBSD, D=Driver Development Kit (DDK), *=planned*

WAN HSSI Interface Modules | The HSSI interface product line offers both PCI and CompactPCI (CPCI) high performance solutions supporting externally clocked line rates up to 52 MHz. This product line is complemented by a wide array of drivers, including Carrier Grade Linux, VxWorks and a comprehensive Driver Development Kit (DDK) to facilitate product integration.

WAN HSSI Interface Modules

	Interface	Form Factor	Protocol	# Full Duplex Ports	Product Description	Drivers
ARIES 720-R & Dual Port RTM	HSSI	CPCI	HDLC	2	i960HD RISC Processor based, Rear panel I/O with associated RTM	D, V
ARIES 721/722-HS	HSSI	CPCI	HDLC	1/2	i960HD RISC Processor based	D, V
MAXIM 524-R & Dual Port RTM	HSSI	PMC	HDLC	2	Rear panel I/O, CPCI RTM	2, B, D, L, S, V, W, X*
WANic 721/722-HS	HSSI	PCI	HDLC	1/2	i960HD RISC Processor based, High Speed Serial Interface (HSSI)	D, V

*Legend: L=Linux, 2=Windows 2000, W=Windows NT, X= Windows XP, V=VXWorks, S= Solaris, B=FreeBSD, D=Driver Development Kit (DDK), *=planned*

WAN OC-3 & OC-12 Interface Modules | SBS offers a wide range of ATM interface product solutions for PCI, CPCI, and ATCA/AMC system applications. This product line is complemented by a wide array of drivers and a comprehensive DDK to facilitate product integration.

WAN OC-3 & OC-12 Interface Modules

	Interface	Form Factor	Protocol	# Full Duplex Ports	Product Description	Drivers
MAXIM 1001-O3M	OC-3	PMC	ATM	1	Multi-Mode Optics, 2/4 MB Local SAR Memory	2, D, L, V, X*
MAXIM 1001-O3S	OC-3	PMC	ATM	1	Single Mode Optics, 2/4 MB Local SAR Memory	2, D, L, V, X*
Telum 1001-O3M	OC-3	AMC	ATM	4	Multi-Mode Optics, 4 MB Local SAR Memory, with Automatic Protection Switching Port (APS)	D, L, V
Telum 1001-O3M/1	OC-3	AMC	ATM	1	Multi-Mode Optics, 4 MB Local SAR Memory	D, L, V
Telum 1001-O3M/2	OC-3	AMC	ATM	1	Multi-Mode Optics, 4 MB Local SAR Memory, with Automatic Protection Switching Port (APS)	D, L, V
Telum 1001-O3S	OC-3	AMC	ATM	4	Single Mode Optics, 4 MB Local SAR Memory	D, L, V
Telum 1001-O3S/1	OC-3	AMC	ATM	1	Single Mode Optics, 4 MB Local SAR Memory	D, L, V
Telum 1001-O3S/2	OC-3	AMC	ATM	1	Single Mode Optics, 4 MB Local SAR Memory, with Automatic Protection Switching Port (APS)	D, L, V
WANic 1001-O3M	OC-3	PCI	ATM	1	Multi-Mode Optics, 2/4/8 MB Local SAR Memory	2, D, L, V, X*
WANic 1001-O3S	OC-3	PCI	ATM	1	Single Mode Optics, 2/4/8 MB Local SAR Memory	2, D, L, V, X*
Telum 1001-O12M/1	OC-12	AMC	ATM	1	Multi-Mode Optics, 8 MB Local SAR Memory	D, L, V
Telum 1001-O12M/2	OC-12	AMC	ATM	1	Multi-Mode Optics, 8 MB Local SAR Memory, with Automatic Protection Switching Port (APS)	D, L, V
Telum 1001-O12S/1	OC-12	AMC	ATM	1	Single Mode Optics, 8 MB Local SAR Memory	D, L, V
Telum 1001-O12S/2	OC-12	AMC	ATM	1	SIngle-Mode Optics, 8 MB Local SAR Memory, with Automatic Protection Switching Port (APS)	D, L, V

*Legend: L=Linux, 2=Windows 2000, W=Windows NT, X= Windows XP, V=VXWorks, S= Solaris, B=FreeBSD, D=Driver Development Kit (DDK), *=planned*

MIL-STD-1553

Reliable. Predictable. Irreplaceable.

For military, avionics and space applications, reliability is a life and death issue. When a pilot sends a command to move a flight control surface, drop a bomb or fire a missile, there's just no room for error. And, more than any other bus protocol, MIL-STD-1553 has a well-deserved reputation for delivering its commands with consistency, reliability and stability.

There are several reasons for this, including the fact that the MIL-STD-1553 bus protocol designates a single bus controller which dictates to all the remote terminals when to send, when to listen; who sends first, who sends next, and so on. It's a simple system, and that's partly why it's so reliable.

In addition, the bus has a very high voltage signal transmission level and a very sensitive receiver, so when the transmitter sends a message, it almost always gets through, even if there's a lot of signal strength loss on the way. And on top of all that, the entire system has a dual redundancy feature that virtually eliminates errors.

Need speed? We have that too.

Even in the most advanced aircraft currently being designed for the future, MIL-STD-1553 continues to be used for the things it does best: flight control, weapons control and engine control. At the same time, as demands for bandwidth increase because of new sensor types (and entirely new platforms like unmanned vehicles) the MIL-STD-1553 bus is being supplemented with faster systems and protocols like Ethernet, Fibre Channel and InfiniBand networks.

SBS offers all these technologies as part of our commitment to provide options to system designers. And unlike commercial products, our offerings are specifically designed and tested to stand up to the demands of harsh environments. We produce the rugged cards, boards and systems that support MIL-STD-1553 in the next generation of land, sea and air platforms.

MIL-STD-1553 | Programmable MIL-STD-1553 interfaces for CPCI, PC/104, ISA, PCI, PMC, PCMCIA, or VME backplanes. Interfaces available with the following functionality:

ASF (Advanced Single Function) products can function as either a Bus Controller (BC), Bus Monitor (BM), or up to 31 Remote Terminals (RT). A Multiple RT option is available on all ASF models.

ABI (Advanced Bus Interface) products provide simultaneous operation as a BC, BM, or up to 32 RTs.

BSF (Basic Single Function) A DDC chipset-based MIL-STD-1553 interface.

ESF (Embedded Single Function) specifically designed as a lower cost alternative to the ASF series, with only the features required for demanding embedded applications.

MIL-STD-1553

	Form Factor	Application	Operating Mode	PASS Option	Temp Range	# Channels	Variable Voltage	IRIG Time Code Option	Maxi-mum I/O	Coupling	Notes
1553-CPC3	3U CPCI	Rugged	Single/Full Function		CC	2 to 3		yes	40 TTL 12 RS 422	Factory Config	Optional FPGA-based IRIG generator, External RT Address, 1 MB RAM
1553-PCI3	PCI	Lab	Single/Full Function		Com XT	2 to 4	yes	yes	40 TTL 12 RS 422	Selectable	Optional FPGA-based IRIG generator, 1 MB RAM
1553-PMC3	PMC	Rugged	Single/Full Function		CC	1 to 4		yes	32 TTL 8 RS 422	Factory Config	Optional FPGA-based IRIG Generator, External RT Address, 1 MB RAM
ABI-cPCI3U	CPCI	Lab	ABI	yes	Com	1	yes	yes	2 TTL	Selectable	
ABI-cPCI3U2	3U CPCI	Lab	ABI		Com XT	1 to 4	yes	yes	5 TTL	Selectable	IRIG not available in ESF; External RT Address; External Clock
ABI-cPCI6U	6U CPCI	Lab	ABI		Com XT	1 or 2	yes	yes	2 TTL	Selectable	External RT Address, External Clock
ABI-PC104	PCI-104	Lab, Rugged	ABI	yes	Com XT	1		yes	2 TTL	Factory Config	External RT Address, External Clock
ABI-PC104-2	PCI-104	Lab, Rugged	ABI	yes	Com XT	2		yes	2 TTL	Selectable	External RT Address, External Clock
ABI-PC3-1	ISA	Lab	ABI	yes	Com XT	1	yes	yes	2 TTL	Selectable	
ABI-PC3-2	ISA	Lab	ABI	yes	Com XT	2	yes	yes	2 TTL	Selectable	
ABI-PCI-1	PCI	Lab	ABI	yes	Com	1	yes	yes	2 TTL	Selectable	External RT Address, External Clock
ABI-PCI-2	PCI	Lab	ABI	yes	Com	2	yes	yes	2 TTL	Selectable	External RT Address, External Clock, 3.3V/5V
ABI-PCM2-1/R	PCMCIA	Lab, Notebook Portable	ABI	yes	Com	1		yes	2 TTL	Factory Config	External RT Address, External Clock
ABI-PMC	PMC	Lab, Rugged	ABI	yes	Com	1		yes	2 TTL	Factory Config	
ABI-PMC2	PMC	Lab, Rugged	ABI		Com XT CC	1 or 2	yes	yes	2 TTL	Selectable	External RT Address, External Clock
ABI-V5	VME	Simulation & Test	ABI		Com	1 or 2	yes	yes	8 TTL	Selectable	Direct Memory Access (DMA)

Continued on next page...

MIL-STD-1553 *(...continued)*

	Form Factor	Application	Operating Mode	PASS Option	Temp Range	# Channels	Variable Voltage	IRIG Time Code Option	Maxi-mum I/O	Coupling	Notes
ABI-V6-1/2	VME	Lab	ABI	yes	Com XT	1 or 2	yes	yes	2 TTL	Selectable	External RT Address, External Clock
ABI-V6-3/4	VME	Lab	ABI	yes	Com XT	3 or 4	yes	yes	2 TTL	Selectable	External RT Address, External Clock
ABI-V6CC	VME	Rugged	ABI	yes	CC	1 or 2		yes	2 TTL	Factory Config	External RT Address, External Clock
ABI-V7	VME	Simulation & Test	ABI		Com	1 or 2	yes	yes	8 Triggers	Selectable	Latest design; PowerPC SBC with ABI PMC daughterboards;
ASF-cPCI3U	CPCI	Lab	ASF		Com	1	yes	yes	2 TTL	Selectable	
ASF-cPCI3U2	3U CPCI	Lab	ASF		Com XT	1 to 4	yes	yes	5 TTL	Selectable	External RT Address, External Clock
ASF-cPCI6U	6U CPCI	Lab	ASF		Com XT	1 or 2	yes	yes	2 TTL	Selectable	External RT Address, External Clock
ASF-PC104	PCI-104	Lab, Rugged	ASF		Com XT	1		yes	2 TTL	Factory Config	External RT Address, External Clock
ASF-PC104-2	PCI-104	Lab, Rugged	ASF		Com XT	2		yes	2 TTL	Selectable	External RT Address, External Clock
ASF-PC3-1	ISA	Lab	ASF		Com XT	1	yes	yes	2 TTL	Selectable	
ASF-PC3-2	ISA	Lab	ASF		Com XT	2	yes	yes	2 TTL	Selectable	
ASF-PCI-1	PCI	Lab	ASF		Com	1	yes	yes	2 TTL	Selectable	External RT Address, External Clock
ASF-PCI-2	PCI	Lab	ASF		Com	2	yes	yes	2 TTL	Selectable	External RT Address, External Clock, 3.3V/5V
ASF-PCM2-1/R	PCMCIA	Lab, Notebook	ASF		Com	1		yes	2 TTL	Factory Config	External RT Address, External Clock
ASF-PMC	PMC	Lab, Rugged	ASF		Com	1		yes	2 TTL	Factory Config	
ASF-PMC2	PMC	Lab, Rugged	ASF		Com XT CC	1 or 2	yes	yes	2 TTL	Selectable	External RT Address, External Clock
ASF-V6-1/2	VME	Lab	ASF		Com XT	1 or 2	yes	yes	2 TTL	Selectable	External RT Address, External Clock
ASF-V6-3/4	VME	Lab	ASF		Com XT	3 or 4	yes	yes	2 TTL	Selectable	External RT Addrss, External Clock
ASF-V6CC	VME	Rugged	ASF		CC	1 or 2		yes	2 TTL	Factory Config	External RT Address, External Clock

1553 Accessories

STUB-EXT	To extend a MIL-STD-1553 bus or stub beyond its normal length limits, SBS offers the MIL-STD-1553 Bus Repeater and Stub Extender products. The length limit of a bus is normally 300 feet and the length limit for a transformer coupled stub length is normally 20 feet. Use of the Bus Repeater and Stub Extender products allows extension of a MIL-STD-1553 bus by an additional 300 feet, and a MIL-STD-1553 stub to over 100 feet.

Serial I/O | SBS offers a wide range of multi-channel serial interface boards for standard bus and expansion architecture such as CompactPCI, VMEbus, IndustryPack, and PMC.

Serial I/O

	Form Factor	Interface	Asynchronous	Synchronous	# Channels	Front I/O	Rear I/O	Opto-Isolated
COM 2360 DTE/DCE	6U CPCI	232/422/485/MIL-STD-188-114A	yes	yes	8	yes		
COM 360	PMC	232/422/485/MIL-STD-188-114A	yes	yes	4	yes	yes	
CP-3202*	3U CPCI	232/422/V.35	yes	yes	4	yes		
HSS-cPCI-CC	3U CPCI	RS232/422/485	yes	yes	4, 8, or 12		yes	
HSS-PMC-CC	PMC	RS232/422/485	yes	yes	4 or 8		yes	
PMC-3210-2F	PMC	RS232	yes	yes	4	yes		
PMC-3211-24F	PMC	RS232/422	yes	yes	4	yes		
PMC-HS-SERIAL	PMC	232/422/V.35	yes	yes	4	yes	yes	
PMC-HSSERIAL2	PMC 66MHz	232/422/V.35	yes	yes	4	yes	yes	
PMC-OCTPRO-232	PMC	EIA-232	yes		8	yes	yes	
PMC-OCTPRO-422	PMC	EIA-422	yes		8	yes	yes	
PMC-OPTO232-ET	PMC	RS232 115 kbaud	yes		4	yes	yes	yes
PMC-OPTO422-ET	PMC	RS422/485 460 kbaud	yes		4	yes	yes	yes
PMC-SERIAL232	PMC	RS232 115 kbaud	yes		16	yes	yes	
PMC-SERIAL422	PMC	RS422 230 kbaud	yes		16	yes	yes	
PMC-SWEET16	PMC	EIA-232	yes		16	yes	yes	

*Legend: * Conduction cooled version available*

ARINC 429 | SBS ARINC interfaces have a common internal architecture and library set. Most interfaces offer individual channel programmability for source or sink and an optional IRIG B receive time stamp. The PCI and PMC interfaces offer on-board transmit channel listen feature. SBS ARINC interfaces provide a feature-rich, user-friendly design to the host system with on-board management of transmission, receive, and data logging execution.

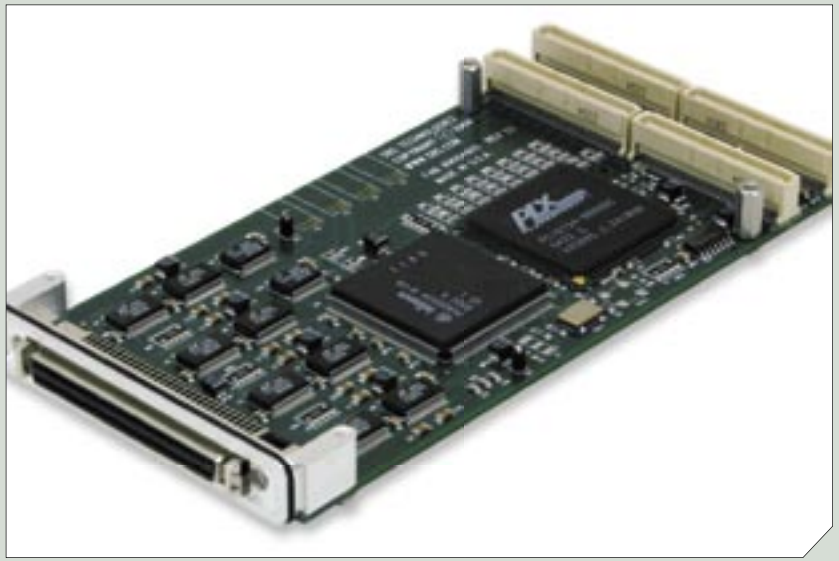
ARINC 429

	Form Factor	Application	# Channels	Software Configurable Channel Allocation	PASS Capable	Temp Range	Variable Voltage	IRIG Time Code Option	I/O	Notes
A429-cPCI3U	3U CPCI	Lab	8	yes		Com			6 External Triggers	
A429-PC	ISA	Lab, Simulation & Test	8 or 16	yes	yes	Com			2 External Clocks, 6 Triggers, 8 Triggers	
A429-PC104	PCI-104	Lab, Rugged	4	yes	yes	Com			2 Triggers	
A429-PCI	PCI	Lab	8	yes	yes	Com		yes	1 External Clock, 4 External Triggers, 6 Triggers	16 channel version has variable voltage
A429-PCI2	PCI	Lab	8 or 16	yes	yes	Com	yes	yes	8 Triggers	
A429-PCM2	PCMCIA	Notebook Portable	8	yes	yes	Com			3 Triggers	
A429-PMC	PMC	Lab, Rugged	16	yes	yes	Com XT CC	yes	yes	1 External Clock, 4 External Triggers	
A429-V2	VME	Lab	16	yes		Com		yes	2 External Clocks, 6 Triggers, 8 Triggers	Special configuration available which routes the I/O to P2 connector

Telemetry Systems | SBS is a premiere supplier of integrated, ground-based telemetry systems for missile, test range, laboratory, and flight test environments. These system solutions transmit data captured by instrumentation and measuring devices to remote stations where it is recorded and analyzed.

Telemetry Systems

	Hardware	Software	Features & Benefits
DDR-100	yes		Telemetry data collection entirely in a digital domain. Data recorded on the DDR-100 system can be immediately FTP transferred, network disk shared, or even emailed upon test completion. Data can be fully accessed on a standard desktop PC without requiring any telemetry hardware.
MDC		yes	Allows DDR users to monitor and control several DDR channels from one central location. DDR channels can be claimed by an MDC master and can have all DDR functions controlled remotely from that MDC master. The MDC software eliminates the need to man each DDR at every site, allowing one user to control individual DDR channels or groups of channels remotely across a network.
RCI		yes	A program designed to receive messages over a network that triggers predetermined sequences of instructions. RCI can assist in a myriad of situations: running demos, performing maintenance on systems from a remote location, or performing repetitive tasks that users were formerly forced to do by hand.
TLM-4002	yes		Real-time telemetry network server and digital telemetry recorder station. Processes 2 PCM streams and one asynchronous embedded stream simultaneously. UDP-IP Ethernet communications support any number of real-time remote workstations. Core software components are made available to users as active-X controls.



Data Bus Analysis Software

	Notes
DataXpress	The ultimate tool for monitoring and visualizing data from a variety of databus interfaces, telemetry downlinks and other analog & discrete sources.
P1000-1553	For legacy applications, the PASS-1000 is the ideal MIL-STD-1553 bus analyzer.
P1000-194-1	For legacy applications, the PASS-1000 is the ideal MIL-STD-1553, WMUX 194, or ARINC 429 bus analyzer.
P1000-A429	For legacy applications, the PASS-1000 is the ideal MIL-STD-1553 or ARINC 429 bus analyzer.
P32-PC	Monitoring bus traffic with the PASS 3200 is designed to be simple to use and interpret utilizing the new Graphical Displays.
P32-PC104-1	Monitoring bus traffic with the PASS 3200 is designed to be simple to use and interpret utilizing the new Graphical Displays. Designed for use for the PC-104.
P32-PC3-1	Monitoring bus traffic with the PASS 3200 is designed to be simple to use and interpret utilizing the new Graphical Displays. Designed for use with the ISA.
P32-PC3-2	Monitoring bus traffic with the PASS 3200 is designed to be simple to use and interpret utilizing the new Graphical Displays. Designed for use with the ISA.
P32-PCI-1	Monitoring bus traffic with the PASS 3200 is designed to be simple to use and interpret utilizing the new Graphical Displays. Designed for use with the PCI.
P32-PCI-2	Monitoring bus traffic with the PASS 3200 is designed to be simple to use and interpret utilizing the new Graphical Displays. Designed for use for the PCI.
P32-PCI-8	Monitoring bus traffic with the PASS 3200 is designed to be simple to use and interpret utilizing the new Graphical Displays. Designed for use for the PCI.
P32-PCI2-16	Monitoring bus traffic with the PASS 3200 is designed to be simple to use and interpret utilizing the new Graphical Displays. Designed for use for the PCI2.
P32-PCM2-1/R	Monitoring bus traffic with the PASS 3200 is designed to be simple to use and interpret utilizing the new Graphical Displays. Designed for use for the PCMCIA.
P32-PCM2-4T4R	Monitoring bus traffic with the PASS 3200 is designed to be simple to use and interpret utilizing the new Graphical Displays. Designed for use for the PCMCIA.
P3200	PASS 3200 is the new generation of SBS bus analyzer capability. Monitoring bus traffic with the PASS 3200 is designed to be simple to use and interpret utilizing the new Graphical Displays.
PASS 1000	For legacy applications, the PASS-1000 is the ideal MIL-STD-1553 or ARINC 429 bus analyzer.

PASS 3200 and PASS 1000

PASS™ 3200 Version 3.0 provides a full suite of advanced features and functions offering expandability and application for use in the laboratory, in flight, on the flight line, or in any application requiring real-time data acquisition and analysis. Utilizing an improved interface with graphical displays and EU conversions, PASS 3200 is both simple to use and allows intuitive interpretation of bus data. New features include remote control over a network, graphical display widgets, full ARINC 429 support, the ability to perform real-time EU conversions, and the ability to time-correlate and simultaneously view data from multiple data buses in a single window.

For older legacy systems, SBS continues to offer PASS 1000. Supporting the 1553, ARINC 429, and F-16 WMUX protocols, PASS 1000 offers features such as disabling individual RTs at any time, error injection, analog & digital displays of bus activity, and data archiving & playback.

DataXpress

DataXpress™ 2.2 is a comprehensive software package for processing and displaying MIL-STD-1553 and telemetry data in real-time. Version 2.2 delivers dramatically improved performance. The software provides a powerful GUI for quick and easy access to individual datawords or bits. You can assign symbolic or variable names to individual 1553 datawords or bits associated with specific RTs and SAs, or to telemetry frames and data values. Each time these words appear in the data stream, DataXpress captures the information. Once captured, the math engine can process the data using standard math functions, or user written equations. After processing, the data can be displayed in a variety of different ActiveX graphics widgets, including strip charts, bar graphs, X-Y plots, tables, and text displays.

DataXpress is scalable from a single laptop data acquisition tool to a full networked configuration with data servers and client workstations performing data acquisition, archival, real-time analysis, post processing, and data replay functions.

Graphics & Video | High-resolution, high-performance graphics I/O solutions are available for embedded video and display applications. Look into our flagship graphics subsystem, the Sentiris S4110 PMC based on NVIDIA® technology, for state-of-the-art performance, image quality, and capabilities.

Graphics & Video

Product Name	Form Factor	Chip Set	I/O	Cooling	Conformal Coating	Extended Temperature Range
PMC-VIDEOPLUS	PMC	SM Lynx3DM8+	DB15	Convection	Option	N/A
Sentiris S4110	PMC	NVIDIA Quadro4	Multiple outputs	Convection	Option	Option
Telum 2001-VGA	AMC full-height	SM Lynx3DM8+	DB15	Convection	N/A	N/A
TS-MPEG-4 Bundle	PMC	Altera Stratix FPGA	RS-170, RTP over UDP	Air & Conduction Cooled	Option	Yes
TS-RS-170 Video Capture PMC	PMC	Altera Stratix FPGA	RS-170	Air & Conduction Cooled	Option	Yes

Audio | SBS Audio PMCs are SoundBlaster®-compatible audio cards capable of interfacing to a single stereo line input, stereo auxiliary input, a microphone, and a mono input, as well as amplifier-driven stereo speaker outputs, hardware volume control, and a mono output.

Audio

	Notes
PMC-AUDIO-BP	General purpose SoundBlaster-compatible audio PMC with rear I/O
PMC-AUDIO-CC	Conduction cooled SoundBlaster-compatible audio PMC with rear I/O; extended temperature range
PMC-AUDIO-FP	General purpose SoundBlaster-compatible audio PMC with front and rear I/O; conformal coating available

iSCSI | SBS iSCSI host controllers offer versatility with Gigabit Ethernet speed for applications requiring a low CPU utilization SCSI peer-to-peer solution as well as NAS and Ethernet networking applications.

iSCSI

Product Name	Notes
PMC-ISCSI-ST	iSCSI host controller & TCP/IP offloaded Ethernet controller PMC with single front-panel Gigabit Ethernet (1000BaseT) interface

SCSI | Add SCSI capabilities to a single board computer or a system. SBS continues to enhance its SCSI cards with a multitude of features that meet a range of requirements.

SCSI

Product Name	Notes
PIM-USCSI3	PIM module for use with PMC-USCSI3BP and PMC-USCSI3CC
PMC-3421-FP	PMC with SCSI1875E interface and front panel I/O
PMC-USCSI-SBP	Ultra SCSI PMC with single-ended signaling; rear panel I/O
PMC-USCSI-SFP	Ultra SCSI PMC with single-ended signaling; front panel I/O
PMC-USCSI3	Ultra 160 SCSI PMC with single channel HD68 interface; front panel I/O
PMC-USCSI320	Ultra 320 SCSI PMC with single channel HD68 interface; front panel I/O
PMC-USCSI3BP	Ultra 160 SCSI PMC with single channel interface; rear I/O supported by PIM-USCSI3
PMC-USCSI3CC	Ultra 160 SCSI conduction-cooled PMC with single channel interface; rear I/O supported by PIM-USCSI3

Analog I/O | SBS offers a range of analog-to-digital and digital-to-analog converters designed for general purpose and industrial use.

Analog I/O

Product Name	Form Factor	Function	Channels	Temp (C)	Opto-Isolated
PMC-AD12-ETB	PMC	12-bit ADC	32 diff/16 SE rear	-40° to +85°	yes
PMC-AD12-ETF	PMC	12-bit ADC	32 diff/16 SE front	-40° to +85°	yes
PMC-AD16-ETB	PMC	16-bit ADC	32 diff/16 SE rear	-40° to +85°	yes
PMC-AD16-ETF	PMC	16-bit ADC	32 diff/16 SE front	-40° to +85°	yes
PMC-DA12-ETB	PMC	12-bit DAC	8 SE rear	-40° to +85°	yes
PMC-DA12-ETF	PMC	12-bit DAC	8 SE front	-40° to +85°	yes
PMC-DA16-ETB	PMC	16-bit DAC	8 SE rear	-40° to +85°	yes
PMC-DA16-ETF	PMC	16-bit DAC	8 SE front	-40° to +85°	yes
PMC-UL-GPIO	PMC	12-bit ADC, DAC, TTL I/O	16 I/O, 8 SE ADC, 8 SE DAC	0° to +70°	

Digital I/O | For applications requiring reliable input and output of analog and digital signals, SBS' digital I/O cards provide a variety of interfaces to connect to special function devices.

Digital I/O

Product Name	Form Factor	Interface	Lines	Temp (C)	Cooling
PMC-DIO-ETB	PMC	24V Opto-isolated Inputs/Ouputs; Rear IO	16/16	-25° to +85°	Convection
PMC-DIO-ETF	PMC	24 Opto-isolated Inputs/Outputs; Front IO	16/16	-25° to +85°	Convection
PMC-DRV32-ETB	PMC	24V High Side FET Opto-isolated Outputs; Rear IO	32	-25° to +85°	Convection
PMC-DRV32-ETF	PMC	24V High Side FET Opto-isolated Outputs; Front IO	32	-25° to +85°	Convection
PMC-IN32-ETB	PMC	Opto-isolated Inputs; Rear IO	32	-40° to +85°	Convection
PMC-IN32-ETF	PMC	Opto-isolated Inputs; Front IO	32	-40° to +85°	Convection
PMC-TTL64-ET	PMC	Unbuffered TTL I/O	64	-40° to +85°	Convection

DSP-BASED I/O | Highly versatile, DSP-Based I/O products provide an interface between the cPCI or VME bus and a flexible array of inputs and outputs.

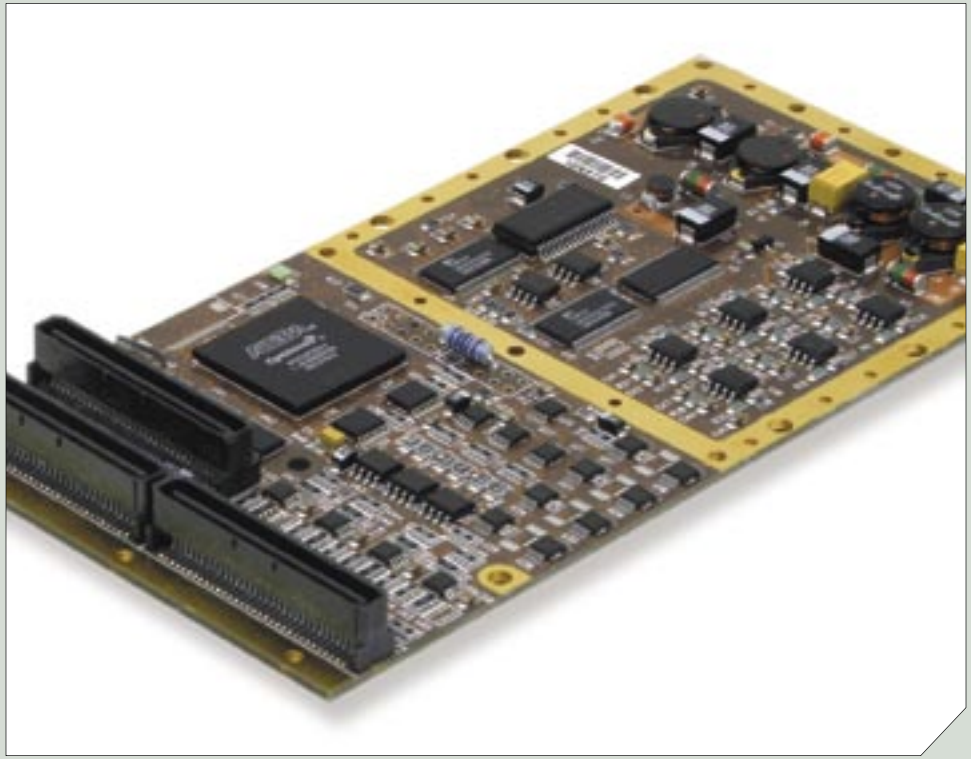
DSP-Based I/O

Name	Form Factor	Inputs	Outputs	Bidirectional	Temp (C)	Cooling
DIO-cPCI3U-CC	3U CPCI	64 HLD Open Collector Inputs; 7 TTL; 6 High and Low LLD Voltage Suppression	5 Lamp Driver Outputs; 4 TTL LLD	None	-40° to +85°	Conduction Cooled
DIO1-6CP	6U CPCI	16 HLD; 16 TTL Level Discrete; 16 HLD Loopback; 16 Differential Logic	16 Differential Logic; 16 Discrete Ground/ Open; 16 TTL Level Discrete;	1 Analog Interface; 8-Channel 10-Bit ADC for monitoring the power supply secondary voltages	-40° to +85°	Conduction Cooled
DIO1-cPCI3U-CC	3U CPCI	8 Bi-Level Optically Coupled	8 Bi-Level Optically Coupled	16 Individually Programmable General Purpose TTL I/O	-40° to +85°	Conduction Cooled
DIO1-VME-CC	VME	120 A/D	104 General Purpose; 8 Software Programmable; 8 High Current	None	-40° to +85°	Conduction Cooled
DIO2-cPCI3U-CC	3U CPCI	8 TTL Bi-Level Discrete	16 Discrete 300 mA 28 V; 16 Discrete Open Collector Outputs; 32 Discrete Source 28 V; 8 TTL Bi-Level Discrete; 1 Four Coil Stepper Motor	1 Analog Interface; 8-Channel 10-Bit ADC for monitoring the power supply secondary voltges	-40° to +85°	Conduction Cooled
DIO2-VME-CC	VME	2 50-kHz Serial Differential Inputs; 20 High-Level 16-Bit Differential Analog	2 50-kHz Serial Differential; 20 High-Level 16-Bit Differential Analog	None	-40° to +85°	Conduction Cooled
DIO3-cPCI3U-CC	3U CPCI	32 0 to 28 Volt Discrete; 4 Analog Frequency; 11 High-Level Single Ended Analog; 28 Low-Level Differential Analog; 2 Frequency Gear Sensor	6 DC Programmable Analog -10 to +10V; 4 Excitation +/-10 Volt	1 Analog Interface - 8-Channel 10-Bit ADC for monitoring the power supply secondary voltages	-40° to +85°	Conduction Cooled
DIO3-VME-CC	VME	32 Analog-to-Digital Converter (ADC)	32 General Purpose Outputs; 1 Tone Generator	None	-40° to +85°	Conduction Cooled
DIO4-cPCI3U-CC	3U CPCI	24 Discrete Ground/Open 0 to 28 V; 16 TTL Level Discrete; 16 HLD Loopback	16 TTL Level Discrete; 16 Discrete Ground/Open	1 Analog Interface; 8-Channel 10-Bit ADC for monitoring the power supply secondary voltages	-40° to +85°	Conduction Cooled

Other I/O | SBS offers a variety of highly reliable, high-performance I/O solutions for embedded computing applications.

Other I/O

Product Name	Notes
PIO-PMC1	Multiple I/O, including High Level Discretes, Open Drain, RS 422/485, TTL, and A/D on a single PMC card.
PMC-ECAN-2	PMC with two CAN 2.0 interfaces
PMC-PCMCIA-BP3	Single-width 32-bit PMC with single socket PCMCIA (PCI Card) interface; PC Card not accessible through the front panel
PMC-PCMCIA-FP3	Single-width 32-bit PMC with single socket PCMCIA (PC Card) interface; PC Card is accessible through the front panel
PMC-PCMCIA-FS3	Single-width 32-bit PMC with single PCMCIA (PC Card) type I or II slot for memory or I/O with front panel access and ISA interrupt support



Plug your PC into a VME chassis.

If you've ever dreamed about controlling your VME system directly from your desktop system, your dream is now a reality. And thanks to SBS Technologies® it's even easier than you dreamed. Just install two boards, connect them with a fiber optic cable and fire up the system. Next thing you know, you'll be sitting comfortably in front of your PC making your VME system jump through its usual hoops.

With this adapter, off-the-shelf software, any desktop PC or workstation you like, and ordinary peripherals, you can create a machine-human interface at truly affordable price/performance levels. Our drivers help make the integration process painless, and the result is a simple, economical way to bring all the things you love about your desktop directly to your embedded applications.

This SBS adapter features memory and I/O mapping, controller mode DMA, interrupts and portable drivers. It directly connects the two buses, which allows the two systems to operate as one. The result is a real-time and deterministic system with low latency and low CPU overhead. The point-to-point connectivity is at the hardware level so no protocol is required and the adapter never detracts from normal system performance.

This adapter is the latest in a long line of SBS bus adapters, dataBLIZZARD™ and bus expansion hardware which allow you to connect and expand the capacity of systems based on PCI, PCI Express, VME, VME64, CompactPCI, PMC and other specialty buses.

VME64 TO PCI BUS ADAPTER INCLUDES:

- VME64 and PCI card set
- Cable up to 500 meters
- Streamlined no-protocol connectivity
- Memory and I/O mapping
- Bi-directional bus mastership
- Controller mode DMA: 70 MB/s
- 2 µsec latency
- VME system controller mode
- DMA modes support dual port RAM
- Byte and word swapping functions
- Software support for Microsoft® Windows®, Linux, IRIX®, Solaris™ and VxWorks®

BUS ADAPTERS | SBS bus adapters directly connect two buses. The virtual bus created allows the two systems to operate as one for seamless operation, superior performance, and the combined benefits of two systems.

Bus Adapters

	Cards Included	Memory Mapping	Controller Mode DMA (MB/s)	Slave Mode DMA (MB/s)	Cable Interface	Interrupts	Optional Dual Port RAM	Loopback Diagnostic
406-1	1 PC/AT, 1 VME	yes	N/A	N/A	Copper to 25ft	Yes	128 KB & 8 MB	
412-1	2 VME	yes	N/A	N/A	Copper to 25ft	2 Programmed, IRQ1-7	128 KB & 8 MB	
414	2 VME	yes	35	N/A	Fiber to 500m	2 Programmed, IRQ1-7	128 KB & 8 MB	
420	2 VME64		N/A	N/A	Copper to 25ft	No		
420-50	2 VME64		N/A	N/A	Copper to 25ft	No		
616	1 PCI, 1 VME	yes	N/A	N/A	Copper to 25ft	2 Programmed, IRQ1-7	128 KB & 8 MB	
618-3	1 PCI, 1 VME	yes	35	13	Fiber to 500m	2 Programmed, IRQ1-7	128 KB & 8 MB	yes
620-3	1 PCI, 1 VME	yes	35	13	Fiber to 500m	2 Programmed, IRQ1-7	128 KB & 8 MB	
800	2 VME64	yes	70	N/A	Fiber to 500m	2 Programmed, IRQ1-7	128 KB & 8 MB	yes
800-202	1 VME64	yes	70	N/A	Fiber to 500m	2 Programmed, IRQ1-7	128 KB & 8 MB	yes
810	1 PCI, 1 VME64	yes	70	N/A	Fiber to 500m	2 Programmed, IRQ1-7	128 KB & 8 MB	yes
810-201	1 PCI	yes	70	N/A	Fiber to 500m	2 Programmed, IRQ1-7		yes
820	1 PMC, 1 VME64	yes	70	N/A	Fiber to 500m	2 Programmed, IRQ1-7	128 KB & 8 MB	yes
820-203	1 PMC	yes	70	N/A	Fiber to 500m	2 Programmed, IRQ1-7		yes
830	1 CPCI, 1 VME64	yes	70	N/A	Fiber to 500m	2 Programmed, IRQ1-7	128 KB & 8 MB	yes
830-204	1 CPCI	yes	70	N/A	Fiber to 500m	2 Programmed, IRQ1-7		yes
P32F-1-3	1 PCI	yes	35	13	Fiber to 500m	2 Programmed		
P32F-3	1 PCI	yes	35	13	Fiber to 500m	2 Programmed		yes
V32F-1-3	1 A32/D32 VME	yes	35	13	Fiber to 500m	IRQ1-7	128 KB & 8 MB	
V32F-3	1 A32/D32 VME	yes	35	13	Fiber to 500m	IRQ1-7	128 KB & 8 MB	yes
Bus Adapter Accessories								
400-202	128K bytes of optional shared memory for SBS bus adapters.							
400-206	8M bytes of optional shared memory for SBS bus adapters.							

IEEE 1394 Host Bus Adapters | IEEE 1394 (also known as FireWire) host bus adapters are the foundation for SBS' fast, easy-to-use, affordable 1394-based connectivity solutions for embedded computers. These OHCI compliant adapters feature three 400 Mb/s ports.

IEEE 1394 Host Bus Adapters

	Host Bus	1394 Speed (Mb/s)	6-pin Ports	Power Class	Galvanic Isolation	OHCI Compliant	Host Bus Voltage	Conduction Cooled
1394B-3CP1		400			yes	yes		yes
2343	yes	400	3	4	yes	yes	yes	
2344-CC	yes	400	3	0	yes	yes	yes	yes

dataBLIZZARD™ | Coupling software and hardware efficiency, the dataBLIZZARD™ point-to-point systems communication interface moves data at high sustained transfer rates with minimal processor overhead.

dataBLIZZARD

	Cards Included	Memory Mapping	Controller Mode DMA (MB/s)	Cable Interface	Interrupts	Semaphores per card
DB0-CPCI-CPCI	2 CPCI	yes	95	Fiber to 500m	2 Programmed	7
DB0-CPCI-PMC	1 CPCI, 1 PMC	yes	95	Fiber to 500m	2 Programmed	7
DB0-PCI-CPCI	1 CPCI, 1 PCI	yes	95	Fiber to 500m	2 Programmed	7
DB0-PCI-PCI	2 PCI	yes	95	Fiber to 500m	2 Programmed	7
DB0-PCI-PMC	1 PCI, 1 PMC	yes	95	Fiber to 500m	2 Programmed	7
DB0-PMC-PMC	2 PMC	yes	95	Fiber to 500m	2 Programmed	7
DBC0-CPCI	1 CPCI	yes	95	Fiber to 500m	2 Programmed	7
DBC0-PCI	1 PCI	yes	95	Fiber to 500m	2 Programmed	7
DBC0-PMC	1 PMC	yes	95	Fiber to 500m	2 Programmed	7

Essential HIPPI Switches | From the entertainment industry to high-tech laboratory environments, HIPPI 800 has proven to be one of the most cost-effective and efficient technologies for moving large volumes of data between high-end workstations and servers. Essential High Performance Parallel Interface (HIPPI) switches provide the high-speed standards-based serial and parallel network connectivity required for large volume real-time data demands.

Essential HIPPI Switches

	Switch Type	Speed (Mb/s)	Maximum # Ports	Slots	Switch Controller Card	Available Dual Port HIPPI Media Interconnect Cards (Hot Swappable)	Power Supply	Chassis
ESS-2000	Non-blocking 32x32 cut-through crossbar switch	800	32	16	SCC 32	Serial; Long Wavelength Serial; Parallel	2 hot swappable	19-inch rack mountable
ESS-800	Non-blocking 8x8 cut-through crossbar switch	800	8	4	SCC 32	Serial; Long Wavelength Serial; Parallel	2	19-inch rack mountable

Essential HIPPI Modems and Repeaters | Essential HIPPI modems and repeaters provide a cost-effective, highly manageable platform for conversion of HIPPI-800 technologies or for extending the distance of HIPPI serial and parallel communications.

Essential HIPPI Modems and Repeaters

	Type	Ports	Connections	Data Rate	Chassis
EDM-LF-LF	Repeater	2	Long wavelength serial to Long wavelength serial	100	19-inch rack mountable or free standing
EDM-P-LF	Modem	2	Parallel to Long wavelength serial	100	19-inch rack mountable or free standing
EDM-P-P	Repeater	2	Parallel to Parallel	100	19-inch rack mountable or free standing
EDM-SF-LF	Modem	2	Short wavelength serial to Long wavelength serial	100	19-inch rack mountable or free standing
EDM-SF-P	Modem	2	Short wavelength serial to Parallel	100	19-inch rack mountable or free standing
EDM-SF-SF	Repeater	2	Short wavelength serial to Short wavelength serial	100	19-inch rack mountable or free standing

Essential HIPPI Network Interface Cards (NICs) | Essential HIPPI Network Interface Cards (NICs) provide high-performance servers and workstations with a fiber-optic serial HIPPI port for gigabit per second connectivity.

Essential HIPPI Network Interface Cards (NICs)

	Form Factor	Bus Frequency/Width	Ports	Media	Wavelength
EC-340-LF	5V PCI	33MHz/32-bit	1 Serial	Fiber	Long
EC-340-SF	5V PCI	33MHz/32-bit	1 Serial	Fiber	Short
EC-343-SF	3.3V PCI	33 & 66 MHz/ 32 & 64-bit	1 Serial	Fiber	Short

PCI Express to PCI-X Expansion | SBS PCI Express to PCI-X expansion systems deliver an easy-to-use migration path to PCI Express for legacy PCI-X and PCI cards. Designed for high throughput and enhanced system functionality, the systems provide seven 64-bit slots with PCI Express cable interfaces. The interfaces support 10 Gb/s raw throughput in each direction. Individual host cards and backplanes are also available. See product datasheet for details.

PCI Express to PCI-X Expansion

	Host Data Bus	Slots Available	Enclosure	Host Card	Backplane Controller	Cable Included
PCIE-PCIX-7S	PCI Express	(1) 64-bit/133 MHz, (2) 64-bit/100 MHz, (4) 64-bit/66 MHz	5U, 19-inch rackmount	PCI Express 4x	Integrated	yes
PCIE-PCIX-7S-LP	PCI Express	(1) 64-bit/133 MHz, (2) 64-bit/100 MHz, (4) 64-bit/66 MHz	5U, 19-inch rackmount	Low profile PCI Express 4x	Integrated	yes

PCI Express to AdvancedMC™ | SBS PCI Express to AdvancedMC expansion systems provide a method to control or access AdvancedMC modules from any host computer with an available PCI Express slot. The AdvancedMC modules are available as if they were plugged into the host computer, but with the benefits of the AdvancedMC form factor such as the hot plug capabilities.

PCI Express to AdvancedMC™

	Host Data Bus	Slots Available	Enclosure	Host Card	Backplane Controller	Cable Included
PCIE-AMC-7S	PCI Express	(1) 4x, single-wide, full-height AMC, (2) 2x, single-wide, half-height AMC, (4) 4x single-wide, half-height AMC	2U, 19-inch rackmount	PCI Express 8x	AdvancedMC® backplane controller card	yes

PCI Expansion | SBS expansion systems offer a simple, cost-effective solution for adding PCI slots to expand computer functionality. These products feature independent operation of host and expansion buses, as well as low latency and high throughput for maximum performance. Individual PCI expansion cards are also available. See product datasheets for details.

PCI Expansion Complete Systems

Product Name	Family	Host Data Bus	5V Slots Available	Enclosure	Cooling Fans	Expansion Bays	Backplane Controller	Power Supply
2123A	32-bit	32-bit/33 MHz PCI	(13) 32-bit/33 MHz	19-inch rackmount	(1) 116 CFM (1) 44 CFM	None	210-2A card	420 Watts
2130	32-bit	32-bit/33 MHz PCI	(7) 32-bit/33 MHz	ATX desktop	(1) 27.5 CFM	(2) 3.5"; (2) 5"	Integrated	300 Watts
2131	32-bit	32-bit/33 MHz PCI	(7) 32-bit/33 MHz	ATX mini-tower	(1) 27.5 CFM	(2) 3.5"; (2) 5"	Integrated	300 Watts
2132	32-bit	32-bit/33 MHz PCI	(7) 32-bit/33 MHz	19-inch rackmount	(2) 42.5 CFM	None	Integrated	300 Watts
OS-PR107	Omnispan®	64-bit/33 MHz PCI	(7) 64-bit/33 MHz	19-inch rackmount	(2) 42.5 CFM	None	Integrated	300 Watts
RS-C100	Reliaspan™	64-bit/33 MHz CPCI	(7) 64-bit/33 MHz	19-inch rackmount	(6) 105 CFM	None	64-bit card	(2) 150 Watts
PCI Expansion Components								
200-2	PCI host card used with any SBS 32-bit PCI expansion enclosure, backplane, or backplane controller card.							
200-2A	Remote power-up PCI host card. Use only with Remote power-up backplane controller card and backplane or rack-mount enclosure.							

PCI Expansion Components *(...continued)*	
201-2	PMC host card used with any SBS 32-bit PCI expansion enclosure, backplane, or backplane controller card.
202-2	CPCI host card used with any SBS 32-bit PCI expansion enclosure, backplane, or backplane controller card.
210-2	PCI backplane controller card used with any SBS 32-bit PCI non-ATX expansion enclosure, any SBS 20X-2 host card, and any SBS non-ATX backplane.
210-2A	Remote power-up PCI backplane controller card; used only with remote power-up host card and backplane or rack-mount enclosure.
212-2	CPCI backplane controller card used with any standard CPCI backplane and any CPCI enclosure.
23-500-2	8-slot non-ATX backplane; two PCI buses; requires 210-2 PCI backplane controller card; compatible with any SBS 32-bit 20x-2 host card.
23-530-2	PCI 7-slot ATX backplane with integrated backplane controller functions and single PCI bus; compatible with any SBS 20x-2 host card; 32-PCI slots support +5V PCI cards.
233-2-0	7-slot ATX desktop enclosure; compatible with any SBS 32-bit 20x-2 host card
233-2-1	7-slot ATX mini-tower enclosure; compatible with any SBS 32-bit 20x-2 host card
233-2-2	7-slot ATX 19-inch rack-mount enclosure; compatible with any SBS 20x-2 host card
24-500-2A	PCI 14-slot ATX backplane compatible with remote power-up host card and backplane controller; 4 PCI buses.
300-2	Long Line PCI host card used for PCI expansion when host system and expansion enclosure separation must be greater than 4 feet.
310-2	Long line PCI backplane controller card used with the 300-2 long line PCI host card for PCI expansion when the application requires host and expansion enclosure separation greater than 4 feet.

Carrier Cards | SBS carrier cards offer a range of I/O expansion solutions for CPCI-, PCI-, and PMC-based systems.

Carrier Cards

	Form Factor	Capacity	Front I/O	Rear I/O	Full Hot Swap Capable	Slots	Bridge	Transition Board
CAR-3CCPMC1								
CP-340-3	3U CPCI	1 PMC	yes		yes	64-bit/66 MHz	Intel 21154BC	
CP-340-5	3U CPCI	1 PMC	yes		yes	64-bit/66 MHz	Intel 21154BC	
CP-620-5V	6U CPCI	2 PMC	yes	yes		32-bit/33 MHz	Intel 21152	TM-683, PP-600
CP-630	6U CPCI	2 PMC	yes	yes		64-bit/133 MHz PCI-X	IBM 133 MHz PCI-X	TM-683, PP-600
CP-640	6U CPCI	2 PMC	yes	yes	yes	64-bit/66 MHz	Intel 21154BC	TM-683, PP-600
CP-640-3	6U CPCI	2 PMC	yes	yes	yes	64-bit/66 MHz	Intel 21154BC	TM-683, PP-600
CP-641	6U CPCI	2 PMC	yes	yes	yes	64-bit/66 MHz	Intel 21154BC	
CPMC1	3U CPCI	1 PMC	yes			32-bit/33 MHz	None	
DCPMC	6U CPCI	2 PMC	yes	yes		32-bit/33 MHz	Intel 21152	
DCPMC64	6U CPCI	2 PMC		yes		64-bit/66 MHz	PLX 6154	
TM-680	6U x 80mm			yes		2		For PMC Carriers
TM-683	6U x 80mm			yes		2		For CP-613, CP-620-5V, CP-630, CP-640

IndustryPack Carrier Cards | These IndustryPack® (IP) carrier cards provide a variety of options for system designers seeking to create special purpose unique functions on a single board using IndustryPack cards.

IndustryPack Carrier Cards

	Notes
BIO-1	Rear panel transition board for CPCI-100A
BIO-3	Rear panel transition board for CPCI-200A; has 50-pin IDC connectors for ribbon-cable
BIO-4	Rear panel transition board for CPCI-200A; has 50-pin SCSI-2 style latching shielded connectors
CPCI-100A-BP	For 3U CompactPCI systems; has 2 IP sites and rear panel I/O
CPCI-100A-FP	For 3U CompactPCI systems; has 2 IP sites and front panel I/O
CPCI-200A-FP	For 6U CompactPCI systems; has 4 IP sites and front panel I/O
CPCI-200B-BP	For 6U CompactPCI systems; has 4 IP sites and rear panel I/O; 3.3V/5V signaling; 8/32 MHz IP slots
PCI-40B	For PCI-based systems; provides 4 IP slots; 3.3V/5V signalling; 8/32 MHz IP slots
PCI-40B-R	For PCI-based systems; provides 4 IP slots; 3.3V/5V signalling; 8/32 MHz IP slots; reduced memory version
PCI-60A-8/32	For PCI-based systems; provides 6 IP slots; 8/32 MHz IP slots
VIPC326-ET	For 3U VMEbus; provides 2 IP slots; extended temperature range of -40° to +85°C; programmed interrupts; ribbon I/O
VIPC326-ET6U	For 6U VMEbus; provides 2 IP slots; extended temperature range of -40° to +85°C; programmed interrupts; ribbon I/O
VIPC327-ET	For 3U VMEbus; provides 2 IP slots; extended temperature range of -40° to +85°C; programmed interrupts; ribbon ejectors
VIPC327-ET6U	For 6U VMEbus; provides 2 IP slots; extended temperature range of -40° to +85°C; programmed interrupts; ribbon ejectors
VIPC626-ET	For 6U VMEbus; provides 4 IP slots; extended temperature range of -40° to +85°C; programmed interrupts; ribbon I/O
VIPC627-ET	For 6U VMEbus; provides 4 IP slots; rear I/O available for slots C & D; extended temperature range of -40° to +85°C; programmed interrupts; ribbon I/O
VIPC628-ET	For 6U VMEbus; provides 4 IP slots; extended temperature range of -40° to +85°C; programmed interrupts; shielded I/O
VIPC664-ET	For 6U VME64x; provides 4 IP slots and has rear panel I/O; extended temperature range of -40° to +85°C; programmed interrupts
VIPC8243	Intelligent 4-slot IP carrier for 6U VMEbus; 250 MHz PPC8240 CPU; 64MB SDRAM; 1 + 8MB FLASH memory; 10/100BaseT Ethernet interface
VIPC8244	Intelligent 4-slot IP carrier for 6U VMEbus; 250 MHz PPC8240 CPU; 64MB SDRAM; 1 + 8MB FLASH memory; 10/100BaseT Ethernet interface; SCSI interface
VPMCC	For 6U VMEBus PCI-over-P0 Dual PMC Carrier
XM-664-60	Transition module; 60x178 for VIPC664-ET
XM-664-80	Transition module; 80x233 for VIPC664-ET

IndustryPack Modules & Transition Modules | IndustryPacks (IPs) and transition modules offer mix and match functionality in a easy-to-use modular form for demanding applications of all types.

IndustryPack Modules & Transition Modules

	Product Description
IP-1553	Single channel MIL-STD-1553B interface with variety of DDC chipset; memory and temperature options
IP-16ADC	Implements 16 single-ended or 8 differential 16-bit analog-to-digital conversion channels
IP-16DAC	Provides 3 independent channels of high-resolution 16-bit digital-to-analog conversion
IP-488	Provides talker, listener, and controller access to the IEEE-488 instrumentation bus
IP-AD12-HG	16 multiplexed; 12-bit analog-to-digital conversion with selectable high gain; 100 KHz
IP-AD12-LG	16 multiplexed; 12-bit analog-to-digital conversion with selectable low gain; 100 KHz
IP-AD12SS	8 channels simultaneously converting 12-bit analog-to-digital conversion; 40 KHz
IP-AD16SS	8 channels simultaneously converting 16-bit analog-to-digital conversion; 40 KHz
IP-ALTERA-CM50	IP with user-programmable Altera FPGA; differential and TTL I/O; with Champ50 cable kit
IP-ALTERA-HD50	IP with user-programmable Altera FPGA; differential and TTL I/O; with HD50 cable kit
IP-ALTERA-IP50	IP with user-programmable Altera FPGA; differential and TTL I/O; with ribbon cable kit
IP-ALTERA-TTL	IP with user-programmable Altera FPGA; TTL I/O; with ribbon cable kit
IP-CM302-25-256	Communications IP with 25MHz MC68302 processor and 256K RAM; three TTL serial channels
IP-CM302-25-512	Communications IP with 25MHz MC68302 processor and 512K RAM; three TTL serial channels
IP-COMM360-25-2	Single-wide IP with 4 serial channels; 25 MHz MC68360 communication processor; 256 KB FLASH; 256 KB SRAM; 2 MB DRAM
IP-DAC	Provides 6 channels of 12-bit digital-to-analog conversion on a single-wide IP
IP-DAC-SU-16	Provides 16 channels of 16-bit digital-to-analog conversion on a single-wide IP
IP-DAQ12-HG	16 multiplexed analog-to-digital conversion; 4 digital-to analog conversion 12 bit; with selectable high gain; 100 KHz
IP-DAQ12-LG	16 multiplexed analog-to-digital conversion; 4 digital-to analog conversion 12 bit; with selectable low gain; 100 KHz
IP-DIGITAL482	48 channels of TTL-level digital I/O, timers, handshakes; replacement for MC68230-based IPs
IP-DIO48-ET	48 TTL level tri-state digital I/O lines with pullups; interrupts; debounce; ESD
IP-DRV16-ET	16 opto-isolated high side switches with 48V; 1A capacity; short circuit protection
IP-DUALPIT2	32 channels of TTL-level digital I/O, timer I/O, timers, handshakes; replacement for MC68230-based IPs
IP-ENET-10BT	IP with LANCE chipset; twisted-pair transition module
IP-ENET-10BT-6U	IP with LANCE chipset; twisted-pair transition module; 6U front panel
IP-EXTENDEDCAN	Extended CAN-Bus controller on a single-wide IP
IP-HIADC-16	Simultaneously sampled 12-bit ADC with 16 channels
IP-MP-SERIAL	Single-wide IP that implements 2 EIA-323/422/485 high-speed synchronous serial ports
IP-MP-SERIAL423	Single-wide IP that implements 2 EIA-423 high-speed synchronous serial ports
IP-NVRAM-2M	Two megabytes of battery-backed SRAM

IndustryPack Modules & Transition Modules *(...continued)*

	Product Description
IP-OCTAL-232	8 EIA-232 asynchronous serial ports, each with RXD, TXD, RTS, CTS & GND signals; 3-level FIFOs; 8 general purpose inputs
IP-OCTAL-422	8 EIA-422 asynchronous serial ports, each with RXD, TXD & GND signals; 3-level FIFOs; 8 general purpose inputs
IP-OCTAL-485	8 EIA-485 asynchronous serial ports, each with DX+, DX- & GND signals; 3-level FIFOs; 4 16-bit timers
IP-OCTALPLUS232	8 channels of asynchronous RS232 115 kbaud serial interface; FIFOs; ESD protection
IP-OCTALPLUS422	8 channels of asynchronous RS422 460 kbaud serial interface; FIFOs; ESD protection
IP-OCTALPLUS485	8 channels of synchronous RS485 2 Mbaud serial interface; FIFOs; ESD protection
IP-OCTALPLUSTTL	8 channels of asynchronous TTL level 460 kbaud serial interface; FIFOs; ESD protection
IP-OCTPL232-ET	8 channels of asynchronous RS232 115 kbaud serial interface; FIFOs; ESD protection; extended temperature range
IP-OCTPL422-ET	8 channels of asynchronous RS422 460 kbaud serial interface; FIFOs; ESD protection; extended temperature range
IP-OCTPLTTL-ET	8 channels of asynchronous TTL 460 kbaud serial interface; FIFOs; ESD protection; extended temperature range
IP-OPTOAD12BPV1	16 opto-isolated, multiplexed 12-bit analog-to-digital channels with gain control 100 KHz; -40° to +85°C
IP-OPTOAD16BPV1	16 opto-isolated, multiplexed 16-bit analog-to-digital channels with gain control 80 KHz; -40° to +85°C
IP-OPTOAV16-ET	Single wide IP with 16 interrupt generating; optically isolated digital inputs; -40° to +85°C operating; 28V avionics use
IP-OPTODA12CH8	8 opto-isolated 12-bit digital-to-analog conversion channels with gain control 70 KHz; -40° to +85°C
IP-OPTODA16CH4	4 opto-isolated 16-bit digital-to-analog conversion channels with gain control 100 KHz; -40° to +85°C
IP-OPTODAQ12-ET	Opto-isolated 12 bit 16 channel multiplexed analog-to-digital conversion; 8 channel digital-to-analog; 80 KHz; -40° to +85°C
IP-OPTOINPUT16	Single-wide IP with 16 interrupt generating; optically isolated digital inputs; -40° to +85°C operating
IP-OPTOINPUT16C	Single-wide IP with 16 interrupt generating; optically isolated digital inputs; commercial temp
IP-OPTOIO-8	Includes 8 optically isolated inputs; 8 optically isolated outputs
IP-OPTOOUT-16	Single-wide IP with 16 optically isolated digital outputs
IP-PREC-ADC	IndustryPack with precision reference and 12-bit ADC
IP-PWI	Single-wide IP with 3 pulse width input channels
IP-QUADHSS232	Single-wide IndustryPack with 4 channels of RS232 synchronous serial interface
IP-QUADHSS422	Single-wide IndustryPack with 4 channels of RS422 synchronous serial interface
IP-QUADHSS485	Single-wide IndustryPack with 4 channels of RS485 synchronous serial interface
IP-QUADHSSTTL	Single-wide IndustryPack with 4 channels of TTL level synchronous serial interface
IP-QUADRATURE	Four quadrature encoder input channels
IP-RELAY	Eight latching form C relays
IP-UD	Provides 24 buffered TTL level I/O lines
IP-UD-D	Single-wide IP with 24 differential I/O lines and EIA-422 differential interface
IP-UD-E	Provides 24 TTL level I/O lines, each with ESD protection circuitry
IP-UD-E-48	Provides 48 TTL level I/O lines, each with ESD protection circuitry
IP-UD-HV-16I8O	Provides 16 high-voltage inputs and 8 high-voltage outputs

IndustryPack Modules & Transition Modules *(...continued)*

	Product Description
IP-UD-I	Single-wide IP with 24 buffered TTL level I/O lines; interrupts
IP-UD-ID	Single-wide IP with 24 differential I/O lines; EIA-422 interface; interrupts
IP-UD-IE	Single-wide IP with 24 TTL level I/O lines with ESD protection circuitry; interrupts
IP-UD-IHV-16I80	Single-wide IP with 16 high-voltage inputs; 8 high-voltage outputs; interrupts
IP-UD-IHV-8I160	Single-wide IP with 8 high-voltage inputs; 16 high-voltage outputs; interrupts
IP-UL-ADC40	40 channels of 12-bit ADC conversion
IP-UNIV-SERIAL	High-speed dual channel synchronous serial ports with support for RS232 and RS422
XM-1553	Passive transition module for SBS IP-1553 IndustryPack
XM-302-1-3U	Transition module supports IP-CM302 products; 3U front panel
XM-302-1-6U	Transition module supports IP-CM302 products; 6U front panel
XM-360-16	Transition module supports 4 IP-COMM360s
XM-360-4	Transition module supports IP-COMM360
XM-OCTAL	Transition module for IP-OCTAL; supports 2 OCTAL serial modules
XM-OCTAL-6U-D	Octal serial 6U mounting transition module with 25-pin D connectors
XM-OCTAL-6U-RJ8	Octal serial 6U mounting transition module with RJ45 connectors
XM-OCTAL6URJ16	Octal serial 6U mounting transition module with RJ11 connectors

PRODUCT INDEX

1394B-3CP1 44
1553-CP3 31
1553-PCI13 31
1553-PMC3 31
2123A 46
2130 46
2131 46
2132 46
2343 44
2344-CC 44
406-1 43
412-1 43
414 43
420 & 420-50
(VME Repeaters) 43
616 43
618-3 43
620-3 43
800 43
800-202 43
810 43
810-201 43
820 43
820-203 43
830 43
830-204 43
A429-cPCI 34
A429-PC 34
A429-PC104 34
A429-PCI 34
A429-PCI2 34
A429-PCM2 34
A429-PMC 34
A429-V2 34
AMC-7S-CHASSIS 7
ARIES 720-R &
Dual Port RTM 29
ARIES 721/722-HS 29
ABI-ASF Products ... 31 & 32
AVC-cPCI 3000 4
AVC-cPCI 3001 4
AVC-cPCI 3002 4
AVC-cPCI 3003 4
AVC-cPCI 3004 4
AVC-cPCI 3005 4
AVC-cPCI 3006 4
AVC-cPCI 3007 4
AVC-cPCI 3008 4
AVC-cPCI 3009 4
AVC-cPCI 3010 4
AVC-cPCI 6000 4
AVC-cPCI 6001 4
AVC-cPCI 6002 4
AVC-VME 6000 4
AVC-VME 6001 4
AVC-VME 6002 4
AVC-VME 6003 4
AVC-VME 6004 4
AVC-VME 6005 4
AVC-VME 6009 4

CA3 10
CAR-3CCPMC1 47
CK5 11
CL7 10
CL9 10
CM4 11
Com 2360 DTE/DCE 33
Com 360 33
CP-3202 33
CP-340 47
CP-613 47
CP-620-5V 47
CP-630 47
CP-640 47
CP-641 47
CP3-GESW12M 23
CP3-GESW24M 23
CP3-GESW8 23
CP3-GESW8N 23
CP3-QUAD100TX 25
CP6-GIGSW8-C1AA 23
CP6-GIGSW8-C1AB 23
CP6-GIGSW8-C1BB 23
CP6-GIGSW8-P1AA 23
CP6-GIGSW8-P1AB 23
CP6-GIGSW8-P1BB 23
CP9 10
CR3 10
CR7 10
CR9 10
CT7 10
CT8 10
CT9 10
DataXpress 36
DB0-CPCI-CPCI 44
DB0-CPCI-PMC 44
DB0-PCI-CPCI 44
DB0-PCI-PCI 44
DB0-PCI-PMC 44
DB0-PMC-PMC 44
DBC0-CPCI 44
DBC0-PCI 44
DBC0-PMC 44
DCPMC64 47
DDR-100 35
DIO-cPCI3U-CC 40
DIO1-6CP 40
DIO1-cPCI3U-CC 40
DIO1-VME-CC 40
DIO2-cPCI3U-CC 40
DIO2-VME-CC 40
DIO3-cPCI3U-CC 40
DIO3-VME-CC 40
DIO4-cPCI3U-CC 40
DIO-cPCI3U-CC 40
EC-340-LF 45
EC-340-SF 45
EC-343-SF 45
EC6 13
EDM-LF-LF 45
EDM-P-LF 45
EDM-P-P 45
EDM-SF-LF 45
EDM-SF-P 45
EDM-SF-SF 45
EIS-4024-1U 20
EIS-4024-1UA 20
EIS-4144-10U 20
ESS-2000 45
ESS-800 45
FC22A-CCPMC-1C 22
FC22A-PCI-1C 22
FC22A-PCI-1F 22
FC22A-PCI-CC 22
FC22A-PCI-FF 22
FC22A-PMC-1C 22
FC22A-PMC-1F 22
FC22A-PMC-CC 22
FC22A-PMC-FF 22
FC2312-PMC-CC 22
FC2312-PMC-FF 22
FC23-PMC-1C 22
FC23-PMC-1F 22
HSS-CPCI-CC 33
HSS-PMC-CC 33
IB4X-CPCI-2A 20
IB4X-LPCIEXP-2 20
IB4X-LPCIX-2 20
IB4X-LPCIX-2A 20
IB4X-LPCIX-IRIX 20
IB4X-LPCIX-KIT 20
IB4X-OMC 20
IB4X-PCIX-2 20
IB4X-PMC-2 20
IB4X-PMC-2A 20
IB4X-PMC-KIT 20
IB4X-V41 20
IB4X-VXWORKS 20
IP-1553 49
IP-16ADC 49
IP-16DAC 49
IP-488 49
IP-AD12-xG 49
IP-AD1xSS 49
IP-ALTERA 49
IP-ALTERA-TTL 49
IP-ARINC-2-ET 49
IP-ARINC-4-ET 49
IP-CM302-25-256 49
IP-COMM360-25-2 49
IP-DAC 49
IP-DAC-SU-16 49
IP-DAQ12-xG 49
IP-DIGITAL482 49
IP-DIO48-ET 49
IP-DRV16-ET 49
IP-DUALPIT2 49
IP-ENCODER-6 49
IP-ENET-10BT 49
IP-EXTENDEDCAN 49
IP-FLASH 49
IP-HIADC-16 49
IP-MP-SERIAL 49
IP-MP-SERIAL423 49
IP-NVRAM-2M 49
IP-OCTAL-232 50
IP-OCTAL-422 50
IP-OCTAL-485 50
IP-OCTALPLUS232 50
IP-OCTALPLUS422 50
IP-OCTALPLUS485 50
IP-OCTALPLUSTTL 50
IP-OCTPL232-ET 50
IP-OCTPL422-ET 50
IP-OCTPLTTL-ET 50
IP-OPTOAD12BPV1 50
IP-OPTOAD16BPV1 50
IP-OPTOAV16-ET 50
IP-OPTODA12CH8 50
IP-OPTODA16CH4 50
IP-OPTODAQ12-ET 50
IP-OPTOINPUT16 50
IP-OPTOINPUT16C 50
IP-OPTOIO-8 50
IP-OPTOOUT-16 50
IP-PWI 50
IP-QUADHSS232 50
IP-QUADHSS422 50
IP-QUADHSS485 50
IP-QUADHSSTTL 50
IP-QUADRATURE 50
IP-RELAY 50
IP-STEPPER 50
IP-UD 50
IP-UD-D 50
IP-UD-E 50
IP-UD-E-48 50
IP-UD-HV-16I8O 50
IP-UD-HV-8I16O 50
IP-UD-I 51
IP-UD-ID 51
IP-UD-IE 51
IP-UD-IHV-16I8O 51
IP-UD-IHV-8I16O 51
IP-UL-ADC40 51
MAXIM 524-E1 28
MAXIM 524-E1R 28
MAXIM 524-R &
Dual Port RTM 29
MAXIM 524-R &
Quad Port RTM 26
MAXIM 524-SE 26
MAXIM 524-T1 28
MAXIM 600-R 28
MAXIM 1001-O3M 29
MAXIM 1001-O3S 28
MAXIM 1001-TEJ 2MB ... 28
MDC 35
OS-PR107 46
Palomar 500 13
PASS 1000 36
PASS 3200 36
PC6 13
PC7 13
PC7 rugged 13
PCIE-AMC-7S 46
PCIE-PCIX-7S 46

PCIE-PCIX-7S-LP..... 46
PIM-USCSI3 38
PIO-PMC1.....41
PMC-100BT-FP 25
PMC-3101-BP 25
PMC-3101-BP-CC 25
PMC-3101-FP..... 25
PMC-3102..... 25
PMC-3104-BP2 25
PMC-3104-FBR 25
PMC-3104-FP 25
PMC-3210-2F..... 33
PMC-3211-24F 33
PMC-3421-FP..... 38
PMC-AD12-ETx..... 39
PMC-AD16-ETx..... 39
PMC-AUDIO-BP 37
PMC-AUDIO-CC..... 37
PMC-AUDIO-FP..... 37
PMC-DA12-ETx 39
PMC-DA16-ETx..... 39
PMC-DIO-ETx..... 39
PMC-DRV32-ETx..... 39
PMC-ECAN-2 41
PMC-GBIT-DF2AA..... 24
PMC-GBIT-DF2BB 24
PMC-GBIT-DT2BP..... 24
PMC-GBIT-DT2CC..... 24
PMC-GBIT-SF2A..... 24
PMC-GBIT-SF2B 24
PMC-GBIT-SF2D..... 24
PMC-GBIT-SF2E 24
PMC-GBIT-SFMT 24
PMC-GBIT-SFSC..... 24
PMC-GIGABIT-DT2..... 24
PMC-GIGABIT-SF 24
PMC-GIGABIT-ST 24
PMC-GIGABIT-ST2 24
PMC-GIGABIT-ST3 24
PMC-HS-SERIAL 33
PMC-HSSERIAL2 33
PMC-IN32-ETx..... 39
PMC-ISCSI-ST..... 38
PMC-OCTPRO-232..... 33
PMC-OCTPRO-422 33
PMC-OPTO232-ET 33
PMC-OPTO422-ET 33
PMC-PCMCIA-FS3.....41
PMC-PCMCIA-xP3.....41
PMC-SERIAL232 32
PMC-SERIAL422 32
PMC-SWEET16 32
PMC-TTL64-ET 39
PMC-UL-GPIO 39
PMC-USCSI3..... 38
PMC-USCSI-DFP..... 38
PMC-USCSI-SxP..... 38
PMC-VIDEOPLUS..... 37
RCI 35
RCOM05..... 5
RCOM05-ATR-6V..... 5
RCOM06..... 5
RCOM10 5
RL4.....11
RS-C100..... 46
RIU-1000..... 5
SCC484Txxx 7
SCC784Txxx 7
SCxxx 7
Sentiris S4110 37
Stub Extender 32
TELUM 1001-DE 26
TELUM 624/628-TEJ..... 28
TELUM 1001-O3 29
TELUM 1001-012 29
TELUM 2001-VGA..... 37
TELUM ASLP10.....13
TELUM FC2312..... 22
TELUM GE-QT..... 24
TLM-4002..... 35
TM-630..... 49
TM-680..... 49
TS-104-3001 16
TS-CPCI-8001.....16
TS-CX-0001.....17
TS-DK-CPC01 17
TS-DK-GP01 17
TS-DK-GP02 17
TS-DK-GP03 17
TS-DK-IT01 17
TS-DK-IT02 17
TS-DK-PMC01 17
TS-DK-PMC02 17
TS-DK-SDR1 17
TS-DK-SDR2 17
TS-FX-2501.....16
TS-FX-4001 16
TS-IX-CL01 16
TS-IX-CL02 16
TS-IX-GP01.....16
TS-IX-LV01 16
TS-IX-RS01.....16
TS-MPEG-4 Bundle 37
TS-PCI-2501 16
TS-PCI-4001 16
TS-PMC-3001 16
TS-PMC-4001 16
TS-PMC-4002.....16
TS-RS-170 37
V2S 12
V32F-1-3 43
V32F-3 43
V5C.....12
VD-FOE 24
VG4.....12
VG5.....12
VIPC326-ET 48
VIPC326-ET6U 48
VIPC327-ET 48
VIPC327-ET6U 48
VIPC626-ET 48
VIPC627-ET 48
VIPC628-ET 48
VIPC664-ET 48
VIPC824x 48
VPMCC 48
VXS1 12
VP7 12
VP9 12
VR7 12
VR9 12
WANic 1001-DE 26
WANic 1001-DEM..... 26
WANic 1001-O3M 29
WANic 1001-O3S..... 29
WANic 1004/1008 28
WANic 521/522-DS..... 26
WANic 521/522-E1 28
WANic 521/522-E3 26
WANic 521/522-SE 26
WANic 521/522-T1..... 28
WANic 604/608-E1..... 28
WANic 604/608-E1P32... 28
WANic 604/608-E1P32... 28
WANic 604/608-SE..... 26
WANic 604/608-T1 28
WANic 604/608-T1P32 ... 28
WANic 604/608-T1P32 ... 28
WANic 721/722-DS..... 26
WANic 721/722-E3 26
WANic 721/722-HS..... 29
XM-1553 51
XM-360-16.....51
XM-360-4 51
XM-664-60 48
XM-664-80 48
XM-OCTAL.....51
XM-OCTAL-6U-D 51
XM-OCTAL6URJ16 51
XM-OCTAL-6U-RJ8 51

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